

159	WOUND STORAGE PACKAGE	328.1	..Radially shiftable hub component
160.1	..Convolute coil (e.g., wound web)	328.2	..Driven supply coil
160.2	..Plural coils	329	.Winding into coil center
160.3	..Axial retainer (e.g., flange)	329.1	..Having coil hub expander
160.4	..For particular coiled material	330	.Simultaneously driven carriers (e.g., separate optic and sound webs)
163	.Interconvolutionary strand delivery	331	.Intermediate storage (e.g., low inertia bin)
164	.Strand end feature	331.1	..Vacuum column
165	..Strand end forms winding	331.2	...Carrier responsive control
166	.Plural windings	331.3	....Pneumatic pressure controller
167	..Serially connected	331.4	....Photoelectric controller
168	.Distorted winding	331.5	..Having spool or carrier brake control
169	..Spooled	332	.Including threading
170	.Housing or outer peripheral support	332.1	..Having particular automated control
171	..With strand guide	332.2	...Actuated by lead end sensor
172	.Strand restraining or snarl preventing means	332.3	..Having pneumatic assist
173	..Adhesive	332.4	..Having leader gripper or coupling
174	.Particular winding	332.5	..Having rotary extractor (e.g., stripper)
175	..Cone wind	332.6	...Endless belt
176	..On core	332.7	..Having carrier to spool attachment means
177	...Plain cone core	332.8	...Slotted spool
178	...Plain cylinder	333	.Automated stop or reverse
324	UNWINDING AND REWINDING A MACHINE CONVERTIBLE INFORMATION CARRIER (E.G., MAGNETIC TAPE OR PHOTOGRAPHIC FILM)	333.1	..Diverse control signal inputs
324.1	.Carrier helically or randomly wound (e.g., magnetic wire, edge wound film, etc.)	333.2	..Carrier supported signal
324.2	..Cartridge storage	333.3	..Carrier engaging tension sensor
324.3	..Carrier distributor	333.4	...Electrical control
325	.Endless coiled carrier (i.e., closed loop)	333.5	..Coil diameter sensor
325.1	..Wound into superposed coil pair	333.6	..Coil rotation sensor
325.2	..Having carrier responsive control	333.7	...Electrical control
325.3	..Reversible	334	.Carrier speed or tension control
326	..Cartridge storage	334.1	..Plural speeds
326.1	...Insertion responsive component	334.2	..Diverse signal inputs
326.2	...Particular cartridge structure	334.3	...Tachometer-type signal device
326.3	....Coil support	334.4	..Tachometer-type signal device
326.4	....Carrier guide	334.5	..Coil diameter or weight responsive sensor
327	..Particular coil support	334.6	..Carrier tension responsive signal
327.1	...To accommodate convolution speed variations	335	.Cartridge system (i.e., cartridge work station or cartridge)
327.2	...Radial roller	336	..Adaptive or convertible
327.3	...Multiple pulleys or hub rollers	337	..Plural (i.e., multiple cartridges per work station)
327.4	....Cooperating pulley pair	337.1	...Coil to coil
328	.Unwinding from coil center		

- 338 ..With insertion responsive component
- 338.1 ...Releasable brake
- 338.2With shiftable cover actuator
- 338.3Acting on plural coils
- 338.4 ...Cartridge positioner
- 339 ..Cartridge ejector
- 340 ..With particular drive mechanism
- 341 ..Coil-to-coil cartridge
- 342 ...With particular drive coupling
- 343 ...With brake or lock
- 343.1Yieldable brake
- 343.2Spool or coil engaging
- 344 ...With indicator or detector
- 345 ...With particular coil support
- 345.1Coaxial coils
- 345.2Spring pressed coil or spool
- 345.3Coil on liner
- 346 ...With particular guide or guard
- 346.1Shiftable mounted
- 346.2Rotatable
- 347 ...With particular housing construction
- 347.1Shiftable closure (e.g., door)
- 347.2Separable or hinged sections
- 348 ..Single coil cartridge (e.g., film magazine)
- 348.1 ...With carrier inner end collector
- 348.2 ...With carrier outer end retainer
- 348.3 ...With means to facilitate unwinding
- 348.4 ...Light occludent
- 349 ..With particular drive
- 350 ..Manual
- 351 ..Nonelectrical motor
- 352 ..Simultaneous drive to supply and take-up coils
- 352.1 ...Each drive a motor
- 352.2With additional linear feed drive motor
- 352.3 ...Coil engaging drive
- 352.4Endless belt
- 352.5 ...Multiple carrier speeds
- 353 ..With yieldable loop former
- 354 ..Particular linear feeder (e.g., capstan or sprocket)
- 354.1 ...Plural
- 354.2 ...With particular manual controller
- 355 ..With brake or stop
- 355.1 ...Radially applied
- 355.2By manual operator
- 356 ..Alternately or differently driven coils
- 356.1 ...Coaxial coils
- 356.2 ...Step-driven coil
- 356.3 ...Multiple carrier speeds
- 356.4With particular manual controller
- 356.5 ...By friction drive
- 356.6With one-way clutch
- 356.7Radially acting wheel, disk, or belt
- 357 ..With detector or indicator (e.g., length scale)
- 358 ..Particular frame or frame attachment
- 358.1 ..Including spool support
- 360 **LOOP FORMING (E.G., WINDING A BUNDLE OF WIRE COILS)**
- 361 ..By orbital guide
- 361.1 ..Simultaneous or successive winding
- 361.2 ..About internal loop form
- 361.3 ...With loop discharge device
- 361.4 ..With loop collector
- 361.5 ...With loop bundle unloader
- 362 ..By rotatably driven loop collector
- 362.1 ..Simultaneous or successive winding
- 362.2 ..With loop bundle unloader
- 362.3 ...Stripper plate or arm
- 363 ..With particular loop or coil transfer mechanism
- 364 **UNIDIRECTIONAL WINDING AND UNWINDING**
- 364.1 ..Convolute coil
- 364.11 ..Partial wrap around plural rotatable supports
- 364.12 ..Shifting material axially
- 364.2 ..Distinct supporting surfaces on a support
- 364.3 ...With radial spacing regulator
- 364.4 ..Threading
- 364.5 ..Convertible between variable and fixed number of windings on material support
- 364.6 ..Variable number of windings on support
- 364.7 ..Having material accumulation sensor

364.8	...Senses without material contact	236	....With manual actuator to shift guide to unwind position
364.9	..Rotating winding surface	237	.....Actuator forward of rotor
365	..Movable material displacement means (e.g., wobble plate)	238	.....With line snubber shifted by remote actuator
365.1	...Material removed axially from winding surface	239	.....Rotor and snubber shiftable axially
365.2	...Single material strand simultaneously wound into or unwound from plural coils	240	.....Guide shifted radially
365.3	..Stationary winding surface (e.g., with flyer)	241	...With level-winding mechanism
365.4	...Brake providing resistance to removal of material	242	...Eccentric cam reciprocates spool
365.5	...Adjustable drum surface (e.g., variable diameter)	243	...With brake
365.6	..Fixed number of windings on winding surface (e.g., positive feeder)	244	...Continuously applied
365.7	..Automatic control or regulation of speed of winding surface	245	....Between spool shaft and frame
365.8	..Manually adjustable winding surface speed	246	....Between spool and spool shaft
365.9	..Manual drive	247	....Positive
366	..Winding drum details	248	....Defines home position of reel part
366.1	...Variable diameter	249	..With drive mechanism
366.2	..Shifting material axially on support	250	...Motor driven
366.3	..Distributing material along the support	251	....Spring motor
366.4	..Particular drive	252	....Motor actuated in response to pull on line
370	REELING DEVICE	253	....With independent manual drive
223	..Fishing rod reel	254	....With spring charger
224	..Axial unwinding (i.e., spinning reel)	255	...Multiple drive ratio
225	...Motor driven	256	...Ratchet-type drive
226	....Spring motor	257	...With disengageable positive drive components (e.g., a clutch)
227	...Spool rotatable to wind	258	...With alternative yieldable mechanism
228	....With guide shiftable between wind and unwind positions	259	....Axially engaged
229	....Spool pivotal between wind and unwind positions	260	....Coaxial of spool
230	...With winding guide on rotor rearward of spool	261	.....Reengageable responsive to drive rotation
231	....Guide shiftable on rotor	262	...Reengageable responsive to drive rotation
232	.....Guide shifted to wind position by rotor drive	263	....Gear pair
233	.....Guide shifted to unwind position by discrete manual operator	264	...With yieldable drive coupling (e.g., friction or fluid clutch)
234	...With winding guide on rotor forward of spool	265	...Variable by crank manipulation
235	....Rotor drive shifts guide to unwind and wind positions	266	....Variable within distinct range(s)
		267	...Between drive shaft and crank
		268	...Between drive shaft and gear
		269	....Coaxial with line take-up
		270	.....Axially applied
		271	.....By center pin
		272	...With feed roller

273	...With level winding	314	....Rotated joint
274	....Line shifts along rotatable cam bar	315	.....Threaded
275	....Line traction guide wheel	316	...Reel support (e.g., reel foot)
276	....Manually shifted guide	317	...Stub shaft support
277	....Drive mechanism oscillates guide	318	....With spool retainer feature
278	....Drive mechanism reciprocates guide	319	...With line or water shield
279	.....Reversely threaded screw	320	..With lubrication feature
280	.....Guide shiftable between wind and unwind positions	321	..With bearing feature
281	.....Guide has line removal opening	322	..Spool or spool shaft feature
282	...Alternative right or left side drive	323	..Reel attachment
283	...Hand crank feature	371	.With spring motor
284	....Collapsible or extensible	372	..Plural springs
285	..With brake	373	..Spring exhibits special torque characteristic
286	...Unwinding speed regulator (e.g., anti-backlash brake)	374	..With auxiliary force rewinding
287	....Line tension responsive actuator	375	..Spring attachment
288	....Magnetic	375.1	...Spring force adjustment
289	....Centrifugal	375.2	...Pretensioned spring attachment
290	...Spool bearing brake	375.3	...With transmission
291	...Manual pressure control	376	..Particular spool structure
292	....Radially applied	376.1	...Particular bearing
293	.....Rolling contact	377	..Particular guide structure
294	.....Separable attachment	378	..Multiple windings
295	...Connected to spool by one-way clutch	378.1	...Of centrally gripped material
296	...Adjustable pressure pawl (e.g., braking clicker)	378.2	....End segment anchored
297	...Positive	378.3	.....Material supported spool
298	....One-way	378.4	...On independent spools
299	.....With disabler	379	..Particular frame or frame carrier
300	.....Rotation responsive	379.1	...Energy or stress absorption structure
301	...Radially engaged	379.2	...Frame carrier feature
302	...Axially engaged	380	..Material irregularity (e.g., knot) engageable with stop
303	....Coaxial with spool	381	..Yieldable brake (e.g., friction or fluid)
304	....On adjustable lever	381.1	...Material engaging
305	..With unwinding indicator (e.g., bell or flashing light)	381.2	....Engages wound material
306	...Clicking indicator (e.g., flexible pawl and toothed member)	381.3	....Manually operated
307	...Spring biased pawl	381.4	....Tension responsive
308	....Plural spring sections	381.5	...Centrifugal
309	..With line unwinding limiter	381.6	...Manually operated
310	..Frame or static component	382	..Lock against spool unwinding
311	...Spinning reel frame	382.1	...Material responsive (e.g., automatic lock)
312	...Frame disassembly feature	382.2	....Convertible to emergency locking
313	....Hinged frame section	382.3	....Time delay
		382.4	....Predetermined length of material unwound
		382.5	...Alternately engaged locking pawls
		382.6	...Shiftable spool body

- 383 ...Material speed responsive (e.g., belt sensitive)
- 383.1With lock prevention or sensitivity reduction
- 383.2Inertia operator
- 383.3Axially movable lock
- 383.4Frame mounted locking pawl
- 383.5Opposed pawls on spool
- 384 ...Frame movement responsive (e.g., vehicle sensitive)
- 384.1With lock prevention or sensitivity reduction
- 384.2With pivot pawl
- 384.3Axially movable lock member
- 384.4Multiply positionable operator
- 384.5Pendulum operator
- 384.6Ball operator
- 384.7 ...Manually operated
- 385 ..Lock against spool winding
- 385.1 ...Material movement responsive (e.g., window shade type)
- 385.2With additional lock release
- 385.3Movable locking pawl on frame
- 385.4 ...Manually operated
- 386 ..With orbital wrapping guide
- 387 ..Axial unwinding
- 388 ..Multiple windings
- 388.1 ..Of centrally gripped material
- 388.2 ...With material snagging lock (e.g., midline tightener)
- 388.3With unidirectional brake
- 388.4With integrated crank
- 388.5 ...With mounting frame
- 388.6 ..Plural spools or spool portions
- 388.7 ...Alternatively driven
- 388.8Single power source (e.g., clutched spools)
- 388.9 ..Material stored in loops or variable-size coils
- 388.91 ..Plural coils
- 389 ..With particular drive (e.g., ratchet drive, motor drive)
- 390 ..Motor powered
- 390.1 ...With material length stop
- 390.2 ...For unwinding
- 390.3With coil constrainer
- 390.4 ...Weight
- 390.5 ...Fluid
- 390.6With speed or torque control
- 390.7 ...Vehicle motor (e.g., power take-off)
- 390.8 ...Electric
- 390.9With speed or torque control
- 391 ..Traction driven spool (e.g., ground engaging)
- 391.1 ...Spool shiftable clear of traction surface
- 391.2 ...With spool drive transmission
- 391.3Belt or chain
- 392 ..Spool on vehicle wheel or axle
- 393 ..Peripherally driven spool
- 394 ..Releasable spool drive (e.g., clutched spool)
- 394.1 ...Limited torque (e.g., slip coupling)
- 395 ..Manually rotatable crank or wheel
- 395.1 ...Foldable spool drive crank
- 396 ..With brake
- 396.1 ..Positive
- 396.2 ...One-way
- 396.3Reversible
- 396.4Ratchet and radial pawl
- 396.5 ..Friction
- 396.6 ...Applied to coil or spool (e.g., radial)
- 396.7User pressure application
- 396.8Radially applied
- 396.9Axially applied
- 397 ..With particular guide or guard
- 397.1 ..Guide boom or tube
- 397.2 ..Shiftable mounted guide (e.g., material distributor)
- 397.3 ...Driven shifting device (e.g., cam, crank, or screw)
- 397.4 ...Manually operated
- 397.5 ..Rotary guide
- 398 ..With particular frame or frame carrier
- 399 ..Plural spool positions
- 399.1 ...With discrete actuator
- 399.2 ...Arcuately displaced positions
- 400 ..Combined with nonreel device
- 400.1 ...Hand wrapped
- 401 ..Collapsible or knockdown
- 402 ..With material segment retainer
- 403 ..Mobile carrier
- 403.1 ...Single primary axle (e.g., hand cart)
- 404 ..Releasable mounting (e.g., separable fastener)
- 404.1 ...Flexible strap or harness
- 404.2 ...Clamp (e.g., C-clamp)
- 404.3 ...Hook, ring, or hanger
- 405 ..Hand carried
- 405.1 ...Hand wrapped
- 405.2With distinct handle

405.3	...With distinct handle	420	..Supply coil drive control
406	..With special base or mounting member (e.g., attachment socket or stake)	420.1	...Peripheral drive
407	..With particular spool	420.2	....Belt
407.1	..Collapsible or knockdown	420.3	.....Slackness sensor
410	TENSION CONTROL OR BRAKE	420.4	...Clutch
411	..Cyclic material reserve (e.g., irregularly shaped take-up)	420.5	...Electrical control circuit
412	..Take-up coil drive control	420.6	....Slackness sensor
412.1	..With supply control	421	..Supply coil brake control
412.2	...Plural condition sensors (e.g., slack loop sensors)	421.1	...Plural sensors
412.3	....Diverse (e.g., slack loop and diameter sensors)	421.2	...Coil diameter sensor
413	..With material condition sensor	421.3	...Coil weight sensor
413.1	...Plural sensors	421.4	...Speed, torque, or revolutions sensor
413.2	...Coil diameter responsive sensor	421.5	...Slackness sensor
413.3	...Slackness sensor (e.g., photocell or load cell)	421.6	....With power control circuit
413.4	....With power control circuit	421.7	.....Electrical
413.5	.....Electrical	421.8	....Mechanically applied brake
413.6	.....Switch actuated	421.9	.....Compound leverage mechanism
413.7	....Transmission control	422	..Yieldable coil brake
413.8	.....Yieldable drive (e.g., clutch or slip coupling)	422.1	...Plural
413.9	...Speed of running material sensor	422.2	...Fluid or magnetic brake or operator
414	..Power control circuit (e.g., fluid regulating network)	422.3	...Electrical operator
414.1	...Electrical circuit	422.4	...Radially applied
415	..Transmission control	422.5	...Wound material engaging
415.1	...Yieldable drive (e.g., clutch or slip coupling)	422.6	.....Strap
416	..Supply controlled	422.7	.....Accommodates roll transfer
417	..Reserve loop former	422.8	....Strap
417.1	...Pneumatic	422.9	....Opposed
417.2	...Plural loops	423	...Axially applied
417.3	...Yieldable loop former	423.1	...Coaxial with coil
418	..Feeder associated with coil	423.2	.....Opposed
418.1	...Slackness sensor	430	COMPOSITE ARTICLE WINDING
419	..Drag on running material	431	..Controlled by an electrical property of article
419.1	...Slackness sensor	432	..On internally toothed core (e.g., motor stator)
419.2	...Coil diameter sensor	432.1	..By endless, flexible shuttle
419.3	...Pneumatic or magnetic	432.2	..By compound movement mechanism
419.4	...Clamping	432.3	...Shuttle reciprocated
419.5	....Rotary (e.g., pinch pair rollers)	432.4	....And oscillated
419.6	...Successive	432.5	.....With radially shifted guide component
419.7	....Shiftable (e.g., variable tortuous course)	432.6	..Having particular core holder or material guide
419.8	...Rotary	433	..On externally toothed core (e.g., motor armature)
419.9	....With brake or clutch	433.1	..By compound movement mechanism
		433.2	..By rotating core
		433.3	..By orbiting guide
		433.4	..Having particular core holder or material guide
		434	..Through opening in ring-shaped core

- 434.1 ..By supply coil linked with core
- 434.2 ...Supply coil on rigid spool
- 434.3Having material guide slidable on spool
- 434.4Having guide ring coaxial with spool
- 434.5 ..By supply coil cycling through opening
- 434.6 ...Supply coil tangentially positioned on a winding shuttle
- 434.7 ..By material end cycling through opening
- 434.8 ..Multistep cycle
- 434.9 ..Having particular core holder or indexing means
- 435 ..On spherical core
- 435.1 ..Core peripherally driven to wind
- 435.2 ...By roller
- 436 ..Modified spherical core or article
- 437 ..On irregularly shaped core
- 437.1 ..Having curvilinear or offset core portions
- 437.2 ...Diverse coils
- 437.3 ..Noncircular core
- 437.4 ...Flattened core
- 438 ..For prestressing core
- 438.1 ..By orbiting material supply
- 439 ..By orbiting material supply
- 439.1 ..Material guide disposed about core tip (e.g., terminal winder)
- 439.2 ...Motor powered
- 439.3Handheld
- 439.4 ..Simultaneous winding
- 439.5 ...On single core
- 439.6Supply coil coaxial with core
- 440 ..Sequential winding
- 440.1 ...On single core
- 441 ..Having mechanism to distribute convolutions
- 441.1 ...Reciprocating
- 441.2 ...Single winding pass
- 441.3Core supports winder
- 441.4Material supply coaxial with core
- 442 ..Handheld wrapping tool
- 443 ..By rotating core
- 443.1 ..Simultaneous winding
- 444 ...On single core
- 444.1Dielectric and conductive layers (e.g., capacitor)
- 444.2Special web layering (e.g., offset edges)
- 444.3Continuous or semicontinuous winding
- 444.4Adjacent helical layers (e.g., strand on strand)
- 444.5Web layer wound between helical layers
- 445 ..Sequential winding
- 445.1 ...On single core
- 446 ..Having manual drive
- 447 ..Having mechanism for distributing convolutions
- 447.1 ...By reciprocating guide or supply
- 447.2Threaded operator
- 447.3 ...Single winding pass
- 448 ..Having particular workpiece holder
- 448.1 ..Core flexure inhibitor (e.g., for winding onto hose)
- 470 **HELICAL OR RANDOM WINDING OF MATERIAL**
- 471 ..For web material
- 472 ..On a hand tool (e.g., tating shuttle or heddle needle)
- 472.1 ..Untwisted fiber bundle (i.e., sliver)
- 472.2 ..Particular traverse of bundle
- 472.3 ..Of twine mass or ball
- 472.4 ..By orbital flyer
- 472.5 ..To form coreless package
- 472.6 ..By orbital flyer
- 472.7 ..On planar form (e.g., card, board)
- 472.8 ..Plural distinct strands onto single spool (e.g., doubling machine)
- 472.9 ..Having material controlled stop
- 473 ...Break or exhaust responsive
- 473.1Separating wound package from driver engaging package periphery
- 473.2 ...Coil diameter responsive
- 473.3Separating wound package from driver engaging package periphery
- 473.4 ..Including wound package or empty spool handling
- 473.5 ..Removing wound package from or loading empty spool onto a winding station
- 473.6 ...Carriage-mounted handling device

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|-------|--|-------|--|
| 473.7 |Including additional material manipulation | 476.5 |Including particular material end gripper |
| 473.8 | ...Including additional material manipulation | 476.6 | ..Including particular material end gripper |
| 473.9 | ...By ejector | 476.7 | .Distributing material along the package |
| 474 | ..Loading supply package on or removing empty spool from unwinding station | 476.8 | ..High frequency, low amplitude traverse superposed on low frequency high amplitude traverse |
| 474.1 | ...On a tray with vertical spool support | 476.9 | ..Rotating take-up having radially movable guide |
| 474.2 | ...Including additional material manipulation | 477 | ...Material guide pressed against wound package |
| 474.3 | ..Alternately or sequentially wound spools | 477.1 | ..Preventing package end ridge |
| 474.4 | ..Spools on parallel spindles | 477.2 | ...By shifting the traversing stroke of guide |
| 474.5 | ...Spindles on indexable turret | 477.3 | ...By varying the traversing speed of guide |
| 474.6 |Coil engaging drive (i.e., peripheral drive) | 477.4 | ..Preventing superposed convolutions in successively wound layers (i.e., ribbon breaker) |
| 474.7 | ...Including particular material snagger | 477.5 | ...By control of guide |
| 474.8 | ..Coaxial spools | 477.6 |Guide traverse speed |
| 474.9 | ...On separately driven spindles | 477.7 | ...By control of take-up |
| 475 |Including particular material snagger | 477.8 |Take-up rotational speed |
| 475.1 | ..Joining ends of material (e.g., knotting, splicing) | 477.9 | ..Traverse speed dependent on direction of motion |
| 475.2 | ..On carriage movable between plural winding stations | 478 | ..Forming symmetrical layer |
| 475.3 | ..Plural winding stations movable to fixed position joining means | 478.1 | ..Stepwise (i.e., orthocyclic) |
| 475.4 | ..Including particular joining structure or control | 478.2 | ..With distribution monitor and correction or indication |
| 475.5 | ..Including inspection or detection of material ends or of joined ends | 478.3 | ..By relatively reciprocating ring rail having an orbital guide |
| 475.6 | ..Including particular material end transfer to joining means | 478.4 | ...Long traverse stroke (e.g., wrap wind) |
| 475.7 | ..Including positioning of material outer end on wound package | 478.5 |Guide stroke limit shifted along package |
| 475.8 | ..Including outer end and removal and repositioning on package | 478.6 | ...Short traverse stroke shifted along package (e.g., weft wind) |
| 475.9 | ...Inserting material end within package | 478.7 |Including forming an initial reserve coil |
| 476 | ..Material outer end removed from package | 478.8 |By control of traverse |
| 476.1 | ..Including particular material to spool connection | 478.9 |By use of auxiliary cam |
| 476.2 | ..By separate preliminary wind | 479 |Including varying rate of shifting of stroke limits |
| 476.3 | ...Preliminary wind overwraps material end | 479.1 |Including varying of stroke length |
| 476.4 | ...Prior to material introduction to traverse guide | 479.2 | ..By progressive shifting of constant traverse stroke |
| | | 479.3 | ...Long traverse stroke (e.g., bobbin tapered at both ends) |

- 479.4On bobbin having cylindrical and frusto-conical portions
- 479.5 ...Short traverse stroke
- 479.6Guide stroke moves progressively along axially stationary package
- 479.7Having progression roller engaging package periphery
- 479.8Including formation of an initial reserve coil
- 479.9Including material controlled stop
- 480Break or exhaust responsive
- 480.1Wound material sensor
- 480.2Forming plural wound packages
- 480.3Including particular presser or shaper for package as it is wound
- 480.4 ..Progressive variation of guide stroke length (e.g., at least one end of package tapered)
- 480.5 ..By lever guided in inclined rail
- 480.6 ..By lever having variable pivot
- 480.7 ...On double-headed spool
- 480.8 ..Manually adjustable traverse
- 480.9 ..Servo-driven guide following moving pattern
- 481 ..Using fluid (fluid motor or direct fluid action)
- 481.1 ..By pneumatic jet distributor
- 481.2 ..Using magnetic device
- 481.3 ..Endless loop mechanism
- 481.4 ...Single guide on endless loop
- 481.5Guide strikes material from opposite sides
- 481.6 ...Counter moving guides (e.g., pins) striking material
- 481.7 ..Counter moving guides (e.g., pins) striking material
- 481.8 ..By cam engaging material
- 481.9 ...Cam is grooved material-receiving spool
- 482 ...Including auxiliary structure for guiding material across cam groove intersection
- 482.1 ...Including auxiliary structure for preventing material from moving beyond ends of grooved cam
- 482.2 ...Wear-resistant groove structure
- 482.3 ...Split drum
- 482.4 ..Guide driven by cam and follower
- 482.5 ...Rotatable guide following stationary cam (e.g., guide on nut on threaded shaft)
- 482.6 ...Driven by cam-contacting lever
- 482.7Adjustable throw lever
- 482.8 ...Rotary cam and linearly shifted follower
- 482.9Threaded cam
- 483Grooved spool and follower
- 483.1Threaded cams with split nut cam followers
- 483.2Having electrical switching device
- 483.3Having reversible cam drive
- 483.4Alternately engageable drives (e.g., alternately operated clutches)
- 483.5Reversely threaded (i.e., cam having opposite threads)
- 483.6Having irregularly threaded portion (e.g., forming tapered package)
- 483.7Details of follower
- 483.8 ..Guide driven by rotating crank or eccentric
- 483.9 ..Guide on driven oscillating lever
- 484 ..By shifting spool
- 484.1 ...Cam shifting mechanism
- 484.2 ..Self traversing (i.e., guide moved by material)
- 484.3 ...Toggling guide bar
- 484.4 ...Follower engaging wound material
- 484.5 ..Traverse drive motor mounted on guide
- 484.6 ..Including particular drive
- 484.7 ..Associated with sewing machine drive for forming wound package for sewing machine shuttle
- 484.8 ...Having material controlled stop
- 484.9 ..Having winding state-controlled stop
- 485 ...Running material sensor
- 485.1Having take-up package sensor
- 485.2Break or exhaust responsive (absence of material)
- 485.3Separating wound package from peripheral drive drum or roll
- 485.4Thickness variation responsive
- 485.5Material length responsive

485.6	...Wound material sensor	526	..Transverse cutting
485.7	....Coil (package) diameter responsive	526.1	...Perforating or notching
485.8	.....Separating wound package from peripheral drive drum or roll	526.2	...With winding of flexible cutter
485.9	..Peripheral drive	526.3	...Special end forming (e.g., tapering)
486	...And driven spindle	527	...Knife shiftable to sever material
486.1	...Including details of take-up-contacting drive	527.1	....Within roller
486.2	...Particular holder or support for spool or wound package	527.2	....Cut adjacent to new core
486.3	...Including speed control	527.3	.....Arcuately shiftable cutter
486.4	...Including drive pressure regulator	527.4	.....With anvil or cooperating cutter
486.5	..Manual	527.5	...Edge-to-edge (e.g., scissor type)
486.6	..Particular drive motor or motor structure	527.6	.....Rotary disk
486.7	..Including speed control	527.7	.....With reactive surface (e.g., anvil)
486.8	..Drive engages spindle	528	.Of discrete sheets or articles
486.9	...Manual	529	.Contracting or expanding spool during winding
487	..Manual	530	.Simultaneous winding
487.1	..And severing	530.1	..Coaxial coils
487.2	..Tension variation responsive	530.2	...Superposed coils
487.3	..Material defect responsive	530.3	...Relatively rotatable coils
487.4	..Coil diameter responsive	530.4	...Multiple coil groups
487.5	..Material length responsive	531	.Sequential winding stations
487.6	..Severing proximate to spool	531.1	..With transitional guide
487.7	..Particular severing device	532	.With particular material connection to take-up
487.8	...Bladeless	532.1	..To take-up leader
487.9	...Multiple blades	532.2	..Pneumatic assist
488	...Blade and coacting anvil	532.3	..Bonded (e.g., adhesive or water)
520	CONVOLUTE WINDING OF MATERIAL	532.4	..Material pierced by take-up component
521	.With tearing or breaking	532.5	..Clamp on take-up
522	.With cutting, perforating, or notching	532.6	..Slotted take-up
523	..Automated control	532.7	..With particular threading facility
523.1	...For transverse cutting	533	.With spool loading or coil removal
524	..Sequential cutting stations	533.1	..With particular spool supply hopper
524.1	...Longitudinal and transverse severing	533.2	..Pivotal transfer device
525	..Longitudinal cutting	533.3	...Peripheral coil support
525.1	...Positionally related slitter and winding surface	533.4	...Turret
525.2	....Slitter engages winding surface	533.5	...With particular turret indexer
525.3	...Includes nonwound strip (e.g., trimming)	533.6	...With particular winding drive
525.4	...Perforating	533.7	..Axially shifted transfer device
525.5	...With particular slitter adjustment	533.8	..Mobile carrier (e.g., wheeled vehicle)
525.6	...By rotary slitter disk		
525.7	....With reactive material support surface		

- 534 .Detector, control, or material responsive stop
- 534.1 ..Responsive to material path
- 534.2 ..Responsive to material length
- 535 ..With feeder
- 535.1 ..Deflecting material into coil (e.g., coreless coiling)
- 535.2 ..Variable or intermittent
- 535.3 ..Driven with take-up or supply
- 535.4 ..Endless belt or chain
- 535.5 ..Special surface (e.g., toothed)
- 536 ..Winding spaced-apart convolutions
- 537 ..Irregularly shaped take-up
- 538 ..With coiled supply
- 538.1 ..Coordinated drive of supply and take-up coils
- 538.2 ..With intermediate access station
- 538.3 ...Enclosed housing for coils
- 538.4 ..Light occludent construction (e.g., light sensitive film holder)
- 539 ..With particular frame
- 540 ..With particular drive
- 541 ..Driver engages coil periphery
- 541.1 ...With spindle driver
- 541.2 ...Coreless
- 541.3 ...Endless belt driver
- 541.4 ..With drive pressure regulator (e.g., nip pressure control)
- 541.5Coil engaging pressure element
- 541.6Fluid actuator
- 541.7Fluid actuator
- 542 ...Plural drums
- 542.1Driven at different speeds
- 542.2Shiftable drum
- 542.3 ...With core steering means (e.g., pivotal mounting or guide rail)
- 542.4 ...Particular drum
- 543 ..Intermittent
- 544 ..Variable speed
- 545 ..With clutch or releasable coupling
- 545.1 ...Limited torque
- 546 ..With particular drive input
- 546.1 ...Manual
- 547 ..Pressure element against coil (e.g., nip pressure member)
- 548 ..With particular material guide or guard
- 548.1 ..Distributing
- 548.2 ..Edge of running web
- 548.3 ..Proximate coil end
- 548.4 ...Noncontacting (e.g., magnetic or air)
- 550 **UNWINDING**
- 551 ..With attachment to preceding material
- 552 ..With accumulator
- 553 ..With lead end modification (e.g., trimming)
- 554 ..With automated control
- 554.1 ...Material registration
- 554.2 ...Cutting
- 554.3 ...Turret indexing control
- 554.4 ...Differentiated material portion (e.g., material end, tear, or signal)
- 554.5 ...Drive or brake control
- 554.6Speed matching (e.g., new roll to running material)
- 555 ..Splicing running material (i.e., flying splice)
- 555.1 ...Shift new material
- 555.2Longitudinal shift
- 555.3 ...Between new roll and expiring material
- 555.4Stationary roll positions
- 555.5Turret support for new roll
- 555.6With particular splicer
- 555.7With peripheral drive
- 556 ..With particular splice means (e.g., glue or pressure)
- 556.1 ...Adhesive tape
- 557 ..Mobile unwinding station (e.g., wheeled conveyance)
- 558 ..With supply coil replenishment
- 559 ..Supply coil transfer apparatus
- 559.1 ...Arcuate transfer path
- 559.2 ...By indexed turret
- 559.3 ...Sequential coil shifting
- 559.4 ...Coil vertically positioned
- 560 ..Reserve coil storage
- 560.1 ...With feeder from subsequent supply
- 560.2 ...Manually shifted reserve coil
- 560.3Radially shifted
- 561 ..Static ramp or track
- 562 ..With material end separator (e.g., doctor blade or jet)
- 562.1 ..With threading along unwinding path
- 563 ..With detector, indicator, or control

563.1	..Unwinding path (e.g., material alignment)	577	..Individually adjustable segment or spoke
563.2	..Material length	577.1	...Yieldable
564	..With drive mechanism	577.2	...Variable spoke alignments
564.1	..Limited interval	577.3	...Bodily retractable spoke
564.2	...Manual crank or lever	577.4	...Linearly shiftable winding surface
564.3	..Feeder spaced from coil	578	..Axially adjustable
564.4	...Roller or sprocket	578.1	..Threaded operator
564.5	..Coil engaging driver	578.2	..Discrete adjustment positions
565	..With unwinding limit	578.3	..Yieldable coil support
566	..With particular guide or guard	579	..With material end retainer
570	COIL HOLDER OR SUPPORT (E.G., SPINDLE, DISPENSER, OR SPOOL)	580	..Outer end
571	..Radially expansible or contractile	580.1	...Edge grip or barrier pair for strip material
571.1	..Inflatable bladder	581	..With attractor (e.g., magnet or vacuum)
571.2	...Plural	582	..Preattached flexible leader
571.3	..Spool loading responsive	583	..Adhesive or hook-and-pile fabric
571.4	...Compressible or deflectable	584	..Material penetrating (e.g., piercing)
571.5	....Longitudinal rib	584.1	...Projection for preformed material opening
571.6	..Rotation responsive	585	..Edge grip pair for strip material
571.7	...Wedging roller or ball	586	..Clamp
571.8	..Axially compressed elastic mass	586.1	...Threaded or cam operator
572	..Longitudinally shiftable operator	586.2	...Separable from coil holder
573	...Cam and follower	586.3	...Bodily displaced
573.1	....Surface wedge	586.4	...Pivoted
573.2	....Longitudinally spaced cams	586.5	....About winding or parallel axis
573.3	.....Opposed	586.6	.....Resilient
573.4	.....Separable (i.e., opposed stubs)	587	..Apertured
573.5	.....Threaded operator	587.1	...Coacting with material fitting or modification
573.6	.....Reverse thread helices	587.2	...Slot
573.7	.....Free end spindle	587.3	...With special access
573.8	.....Radial wedge separates mandrel segments	588	..Randomly oriented coil holder (e.g., portable)
573.9	....Free end spindle	588.1	..With hand or body attachment
574	..Shiftable linkage	588.2	..With distinct hand grip
574.1	...Parallelogram	588.3	..Dispensing container
574.2	...Mutually pivoted (e.g., lazy tong type)	588.4	...Unitary folded blank
574.3	....Trapezoidal	588.5	...Light occludent construction
574.4	....Center actuated, pivoted linkage (e.g., umbrella type)	588.6	...With coil supporting hub
575	..Transversely shiftable operator	590	..Mounted coil holder or spindle (e.g., dispenser or mandrel)
575.1	...Split band spreader	591	..Discrete coil positions
575.2	...Geared segment	592	..Infinitely variable coil positions
575.3	...Rotatable cam or cam follower	593	..Axial material delivery
575.4	....Hinged mandrel segment		
575.5	...Shiftable linkage		
576	..With particular actuator or contractor		
576.1	...Fluid		

- 594 ..Simultaneously available supplies
- 594.1 ...Peripherally supported coil
- 594.2Coaxial
- 594.3 ...Coaxial coils
- 594.4Plural rows or array
- 594.5 ...Row
- 594.6Plural rows or array
- 595 ..Peripheral coil support
- 595.1 ...Roller or endless belt
- 596 ..Opposed stub spindles
- 596.1 ...Spindle on retractable frame arm
- 596.2With latch connecting spindles
- 596.3Pivoted or deflected frame arm
- 596.4 ...Retractable spindle
- 596.5With actuator to retract spindle
- 596.6Helical cam or threaded actuator
- 596.7 ...Particular spindle formation
- 596.8 ...Particular frame formation
- 597 ..Free end spindle support (e.g., cantilever)
- 597.1 ...With releasable coil retainer
- 597.2Spool forms retainer part
- 597.3Radially deflectable retainer
- 597.4Removable retainer
- 597.5 ...Particular spindle formation
- 597.6Spindle-to-spool bearing or coupling
- 597.7 ...Vertical
- 597.8 ...Particular frame formation
- 598 ..Spindle disposed between supports
- 598.1 ...Frame with shiftable arm
- 598.2 ...Frame with pivoted spindle
- 598.3 ...Frame with removable spindle
- 598.4Shiftable spindle retainer
- 598.5 ...Particular frame formation
- 598.6Coil enclosure
- 599 ..Spindle feature
- 599.1Telescoping or meshing surfaces
- 599.2Spaced coil retaining or supporting portions
- 599.3Spindle-to-frame bearing or coupling
- 599.4Spindle-to-spool bearing or coupling
- 600 ..Spool or core
- 601 ..With cover
- 602 ..With convolution or layer separator
- 602.1 ...Helical pattern
- 602.2With particular lead-in or crossover structure
- 602.3 ...Spiral groove (e.g., convolute divider)
- 603 ..With multiple coiling areas
- 604 ..Openwork
- 604.1 ...Wire hub and flange
- 605 ..Stackable
- 606 ..With single or dominant flange
- 607 ..Particular component connection
- 607.1 ...Hinged or slidable for collapsing
- 607.2 ...Convertible assembly
- 608 ...Flange to hub or another flange
- 608.1Flange rotatable on hub
- 608.2Mechanical joint or fastener
- 608.3Discrete fastener (e.g., rivet or staple)
- 608.4Threaded (e.g., bolt or screw)
- 608.5Rotatable joint (e.g., threaded or bayonet fit)
- 608.6Snap fit
- 608.7Bendable tab or crimp
- 608.8 ...Bonded (e.g., welded or cemented)
- 609 ...Hub components
- 609.1 ...Mechanical joint or fastener
- 609.2Threaded fastener (e.g., bolt or screw)
- 609.3Rotatable joint (e.g., threaded or bayonet fit)
- 609.4 ...Bonded (e.g., welded or cemented)
- 610 ..Particular material or material treatment
- 610.1 ...Sheet stock
- 610.2Foldable unitary blank
- 610.3Crimped or hemmed
- 610.4 ...Diverse materials
- 610.5 ...Metal
- 610.6 ...Plastic, rubber, or ceramic
- 611 ..With brake or drive formation
- 611.1 ...Circular rim (e.g., drum, sprocket, or ratchet)
- 611.2 ...Noncircular bore (e.g., spline)
- 612 ..With particular bearing formation

613	..Particular hub or core formation	129.71	..With retainer-spindle
613.1	...Irregularly shaped (e.g., tapered)	129.72	..With guide(s)
613.2	....Cross sectionally	129.8	.With brake for holder and/or strand
613.3	.....Flattened (e.g., card)	130	.For bobbins (i.e., commercial-type strand packages)
613.4	...Reinforcement feature	130.1	..With spindle modified for conical bobbin
613.5	....Flangeless core	130.2	..Vertically suspended spindle
614	..Flange feature	130.3	..Pinboard (i.e., bobbin-storage tray)
614.1	...Reinforcement	130.4	..Skewer
615	MATERIAL GUIDE OR GUARD	131	..Creel
615.1	.Variable guide path	131.1	...Warp type
615.11	.Fluid suspension	132	..Receptacle or trough
615.12	..Turning guide	134	.For a spool (i.e., domestic-type strand package)
615.2	.Rotatable	136	..Carrier attachment
615.21	.Angled turning guide for a web	137	..Receptacle
615.3	.With material confining portion	137.1	...With guide eye
615.4	.With particular guide surface formation or treatment	138	...Single spool
118	BOBBIN OR SPOOL	139	..Stand
118.1	.Open-work structure	140	..Thread guard or guide
118.11	..Resilient	141	.For twine
118.2	.Resilient	146	..Receptacle
118.3	.Cop-tube type (i.e., headless or single-headed tube)	147 R	STRAND TENSIONING DEVICE
118.31	..Reinforcing feature	147 A	.Air
118.32	..Tube material feature	147 M	.Magnet
118.4	.Double-headed spool	148	.Alarm or indicator
118.41	..Plural spools axially connected	149	.Clamp
118.5	..Head(s) adjustable along axis	150 R	..Disk type
118.6	..Head connections (e.g., bolted)	150 M	...Magnetic
118.61	...Inserted head joint	151	..Roller
118.62	....Screw connection(s)	152	...Fluted
118.7	..Spool material feature	152.1	..Ball
118.8	...Sheet stock	153	.Tortuous course
125	.Thread fastener or guide	154	..Adjustable
125.1	..Strand end attacher	155 R	.Wheel or pulley
125.2	...Outer end	155 M	..Magnetic
125.3	....Permits unwinding	155 BW	..Bull wheel
127	SKEIN HOLDER	156	.Brake
128	STRAND UNWINDING DEVICE	156.1	..Peripheral, on material itself
129	HOLDER FOR COILED STRAND	156.2	..Automatic, on disc other than spool
129.1	STRAND TAKE-UP DEVICE	157 R	STRAND GUIDE
129.2	.Lever type	157.1	.Oscillatable or reciprocable
129.3	.Rewind type	157 C	.Pig tail
129.4	.Counterweight type	222	CARD, BOARD, OR FORM
129.5	SUPPORT FOR A STRAND MATERIAL HOLDER	899	MISCELLANEOUS
129.51	.Opposed stub-shafts		
129.53	..With guide(s)		
129.6	.Shaft supported at both ends		
129.62	..With guide(s)		
129.7	.With axial-position retainer for holder		
			<u>CROSS-REFERENCE ART COLLECTIONS</u>

900	PARTICULAR APPARATUS MATERIAL	FOR 109	..Thread presser or pad (242/24)
901	FIGURE EIGHT WINDING	FOR 110	.Wire (242/25 R)
902	LINE LOADER FOR FISHING REEL	FOR 111	..Alternate or successive wind (242/25 A)
903	DRUM FOR A WINCH OR HOIST	FOR 112	.Symmetrical layers (242/26)
904	WATER SKI REEL	FOR 113	.Building mechanism (e.g., ring- rail type) (242/26.1)
905	WINDER WITH STORAGE CHAMBER (E.G., FOR DEODORANT, PAPER, ETC.)	FOR 114	..Wrap wind (i.e., full-traverse mechanism) (242/26.2)
906	STATIC CHARGER OR DISCHARGER	FOR 115	...Means to vary traverse mechanism (242/26.3)
907	VIBRATION CREATION OR DAMPENING	FOR 116	..Weft wind (i.e., short-traverse mechanism) (242/26.4)
908	FLUID TREATMENT OR HANDLING	FOR 117	...Preliminary or bunch winders (242/26.41)
909	HEATING OR COOLING	FOR 118	....By auxiliary cam means (242/ 26.42)
910	CONVOLUTION TIGHTENER OR LOOSENER	FOR 119	....By traverse controlling means (242/26.43)
911	CUTTER	FOR 120	....With means to control gain mechanism (242/26.44)
912	INDICATOR OR ALARM	FOR 121	...Means to vary service traverse or gain (242/26.45)
913	SAFETY DEVICE	FOR 122	.Full traverse mechanism shifted in one direction (242/26.5)
914	SPECIAL BEARING OR LUBRICATION	FOR 123	.Cone wind (242/27)
915	COIL GRIPPER	FOR 124	..Preliminary or bunch winder (242/27.1)
916	HAND TOOL	FOR 125	..detector or stop (242/28)
917	ACCOMODATING SPECIAL MATERIAL OR ARTICLE (E.G., ANTENNA)	FOR 126	...Thread break or exhaust (242/ 29)
918	.Web material (e.g., thermal insulation)	FOR 127	...Load (242/30)
919	..Ground cover (e.g., tarp)	FOR 128	..Quick traverse (242/31)
920	GLASS STRAND WINDING	FOR 129	..Multiple (242/32)

FOREIGN ART COLLECTIONS**FOR 000 CLASS-RELATED FOREIGN DOCUMENTS**

Any foreign patents or non-patent literature from subclasses that have been reclassified have been transferred directly to FOR Collections listed below. These Collections contain ONLY foreign patents or non-patent literature. The parenthetical references in the Collection titles refer to the abolished subclasses from which these Collections were derived.

FOR 100	SPOOLER (242/16)	FOR 131	..Spindle or appurtenance (242/ 35)
FOR 101	.Multiple (242/17)	FOR 132	.Multiple (242/35.5 R)
FOR 102	BOBBIN OR COP WINDING (242/18 R)	FOR 133	..Removing full and supplying empty bobbins (242/35.5 A)
FOR 103	.Ribbon breaker (i.e., means to prevent coil crowding) (242/ 18.1)	FOR 134	..Turret type (242/35.5 T)
FOR 104	.Cutting device (242/19)	FOR 135	.Reserve thread uniting (242/35.6 R)
FOR 105	.Sewing machine shuttle (242/20)	FOR 136	..End finder (242/35.6 E)
FOR 106	..Cutting device (242/21)	FOR 137	.Detector or stop (242/36)
FOR 107	..Stop (242/22)	FOR 138	..Thread break or exhaust (242/37 R)
FOR 108	..Disk type (242/23)	FOR 139	...Knotter (242/37 A)
		FOR 140	...Doubling machine (242/38)
		FOR 141	..Load (242/39)
		FOR 142	...Doubling machine (242/40)
		FOR 143	.Ejector (242/41)
		FOR 144	.Doubling machine (242/42)
		FOR 145	.Quick traverse (242/43 R)

- FOR 146 ..By means to vary traverse mechanism (242/43.1)
- FOR 147 ..By drum guide means (242/43.2)
- FOR 148 ..Counter rotating fingers (242/43 A)
- FOR 149 ..Air jet (242/43 B)
- FOR 150 ..Magnetic (242/43 M)
- FOR 151 ..Spool or bobbin lifter (242/46)
- FOR 152 ..Driving connection (242/46.2)
- FOR 153 ..Modified bobbin or cop (242/46.21)
- FOR 154 ..Cop tube (242/46.3)
- FOR 155 ..Clutch (242/46.4)
- FOR 156 ..Centrifugal (242/46.5)
- FOR 157 ..Resilient head (242/46.6)
- FOR 158 ..Resilient socket (242/46.7)
- FOR 159 ...Coil spring (242/46.8)
- FOR 160 ..Alternate, successive dual wind (242/18 A)
- FOR 161 ..Anti-bounce (242/18 B)
- FOR 162 ..Glass winding (242/18 G)
- FOR 163 ..Change speed (242/18 CS)
- FOR 164 ..Air actuation (242/18 AA)
- FOR 165 ..Drum drive (242/18 DD)
- FOR 166 ..End wind (242/18 EW)
- FOR 167 ..Preliminary wind (242/18 PW)
- FOR 168 **CORDAGE (242/47)**
- FOR 169 ..Unidirectionally moving coils (242/47.01)
- FOR 170 ..With seal for coil support means (242/47.02)
- FOR 171 ..With threading means (242/47.03)
- FOR 172 ..Interdigitated composite rotating surface (242/47.04)
- FOR 173 ...Rigid cages (242/47.05)
- FOR 174 ...Elements pivot on axis parallel to rotating axis (242/47.06)
- FOR 175 ...Independent radially moving elements (242/47.07)
- FOR 176 ..Plural drums (242/47.08)
- FOR 177 ...Single run contacting (242/47.09)
- FOR 178Planetating (242/47.1)
- FOR 179Helically grooved drum (242/47.11)
- FOR 180 ..With lateral material-traverser (242/47.12)
- FOR 181 ...Axially moving element (242/47.13)
- FOR 182 ..Storage on sheaves (242/47.5)
- FOR 183 ..Cutting device (242/48)
- FOR 184 ..Detector (242/49)
- FOR 185 ..Card, board, or form (242/50)
- FOR 186 ..Heddle or seine needle (242/51)
- FOR 187 ..Tatting shuttle (242/52)
- FOR 188 ..Hank or skein winnding (242/53)
- FOR 189 **TRAVERSE MECHANISM (242/158 R)**
- FOR 190 ..Eccentric or crank (242/158.1)
- FOR 191 ..Screw shaft (242/158.2)
- FOR 192 ..Reversely threaded (242/158.3)
- FOR 193 ..Reversing mechanism (242/158.4 R)
- FOR 194 ..Split nut alternately engaging left and right hand screw threads (242/158.4 A)
- FOR 195 ..Cam (242/158.5)
- FOR 196 ..Belt chain traverse (242/158 B)
- FOR 197 ..Air (242/158 F)

DIGESTS

- DIG 1 **TAPE PROGRAM CONTROL MEANS**
- DIG 2 **NARROW FABRIC WINDING APPARATUS**
- DIG 3 **CORELESS COILERS**