

F28G

CLEANING OF INTERNAL OR EXTERNAL SURFACES OF HEAT-EXCHANGE OR HEAT-TRANSFER CONDUITS, e.g. WATER TUBES OR BOILERS (cleaning pipes or tubes in general [B08B 9/02](#); devices or arrangements for removing water, minerals, or sludge from boilers while the boiler is in operation, or which remain in position while the boiler is in operation, or are specifically adapted to boilers without any other utility [F22B 37/48](#); removal or treatment of combustion products or combustion residues [F23J](#); removing ice from heat-exchange apparatus [F28F 17/00](#))

Definition statement

This place covers:

Apparatus and methods for removing deposits from surfaces in contact with heat-exchange media.

References

Limiting references

This place does not cover:

Cleaning tubes or pipes in general	B08B 9/02
Removing incrustation in apparatus for thermal non-catalytic cracking of hydrocarbon oils	C10G 9/12 , C10G 9/16
Non-mechanical removal of metallic material from surfaces	C23F
Cleaning metallic materials by chemical methods	C23G
Cleaning engines cooling systems	F01P 11/06
Devices for removing water, salt, or sludge from boilers	F22B 37/48
Cleaning combustion chambers	F23J
Cleaning arrangements for water heaters	F24H 9/00
Removing ice from heat exchanger	F28F 17/00
Preventing the formation of deposits or corrosion	F28F 19/00

F28G 1/00

Non-rotary, e.g. reciprocated, appliances ([F28G 3/00](#) takes precedence)

Definition statement

This place covers:

Cleaning devices comprising a non-rotary cleaning element, e.g. arranged for linear motion or for back and forth movement.

References

Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning the internal surfaces of tubes by the mechanical action of a moving fluid, e.g. by flushing	B08B 9/032
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The cleaning devices being moved along the pipes by a fluid and conforming to, or being conformable to substantially the same cross-section of the pipes	B08B 9/055
Pigs or moles, i.e. devices movable in a pipe or conduit with or without self-contained propulsion means	F16L 55/26
Soot-blowers for cleaning furnaces	F23J 3/00

F28G 3/00

Rotary appliances

Definition statement

This place covers:

Cleaning devices comprising rotatable cleaning elements, e.g. arranged for turning around at least one axis; Cleaning devices comprising movable cleaning elements, wherein the movement is a combination of a non-rotary movement and a rotary movement.

F28G 5/00

Cleaning by distortion (by vibration [F28G 7/00](#))

Definition statement

This place covers:

Cleaning devices performing a cleaning action by deforming the heat exchange surfaces.

References

Limiting references

This place does not cover:

Cleaning by vibration	F28G 7/00
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F28G 7/00

Cleaning by vibration {or pressure waves}

Definition statement

This place covers:

Cleaning devices performing a cleaning action by producing vibrations on the heat exchange surfaces, e.g. by using knocking devices, or by using pressure pulses, or by producing detonations or explosions.

References

Limiting references

This place does not cover:

Cleaning by distortion	F28G 5/00
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Method and apparatus for producing mechanical vibrations	B06B 1/00
Cleaning by distortion, beating, or vibration of the surface to be cleaned	B08B 7/02

F28G 9/00

Cleaning by flushing or washing, e.g. with chemical solvents (appliances using jets of fluid for removing debris [F28G 1/16](#), [F28G 3/16](#))

Definition statement

This place covers:

Cleaning devices performing a cleaning action by contacting the heat exchange surfaces with a solvent and/or by flowing a washing fluid through the heat exchange conduits.

References**Limiting references**

This place does not cover:

Cleaning by using appliances using jets of fluids for removing debris	F28G 1/16 , F28G 3/16
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Informative references

Attention is drawn to the following places, which may be of interest for search:

Cleaning tubes by the mechanical action of a moving fluid, e.g. by flushing	B08B 9/032
Treatment of water with complexing chemicals or other solubilising agents for softening, scale prevention or scale removal, e.g. adding sequestering agents	C02F 5/08
Cleaning metal pipes by chemical methods	C23G 3/04
Devices for preventing or removing corrosion, slime or scale from water heaters	F24H19/00

F28G 11/00

Cleaning by combustion, e.g. using squibs, using travelling burners
{{[F28G 7/005](#) takes precedence}}

Definition statement

This place covers:

Cleaning devices, performing a cleaning action by contacting the heat exchange surfaces with flames or high temperature fumes for burning the deposits.

References

Limiting references

This place does not cover:

Cleaning by detonations	F28G 7/00
Cleaning by increasing temperature of heat exchange surfaces	F28G 13/00

F28G 13/00

Appliances or processes not covered by groups [F28G 1/00](#) - [F28G 11/00](#);
 Combinations of appliances or processes covered by groups
[F28G 1/00](#) - [F28G 11/00](#)

Definition statement

This place covers:

Other cleaning devices or processes, e.g. cleaning by laser, cleaning by oxidation, cleaning by action of bubbles

F28G 15/00

Details (measuring thickness of deposit [G01B](#))

Definition statement

This place covers:

Details of cleaning devices, e.g. control arrangements.

References

Limiting references

This place does not cover:

Measuring thickness of deposits	G01B
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