Sept. 2, 1941. L. E. WIRTH 2,254,925

PAINT DISINTEGRATOR

Filed March 30, 1939

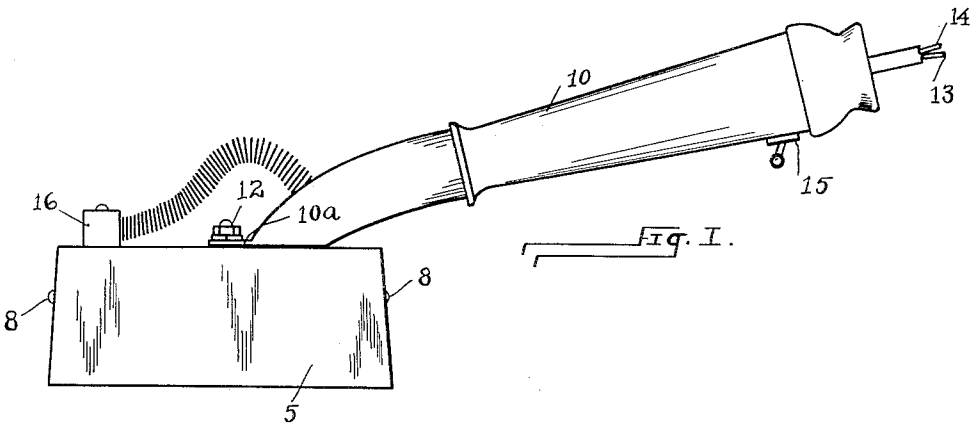


Fig. I.

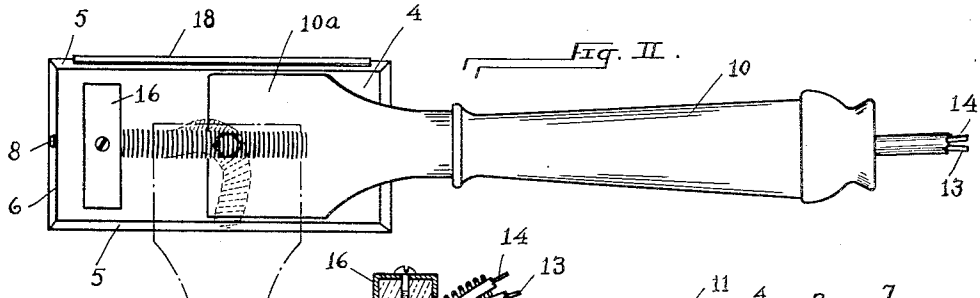


Fig. II.

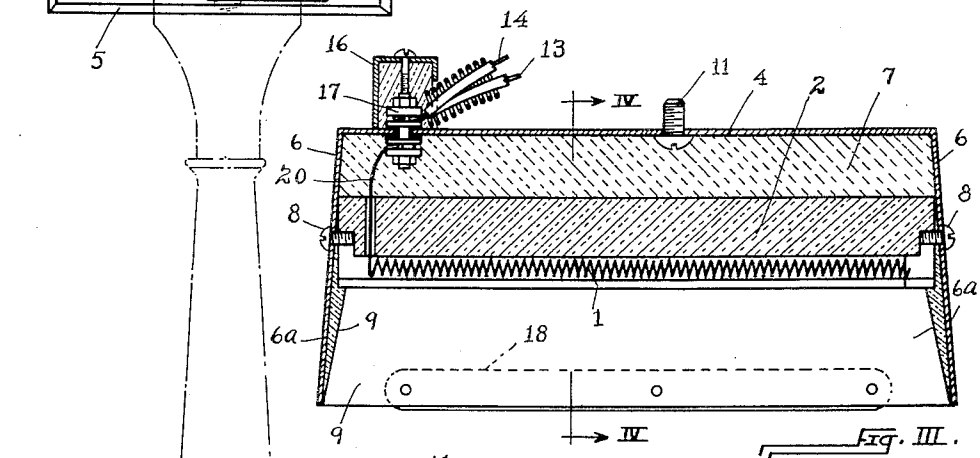


Fig. III.

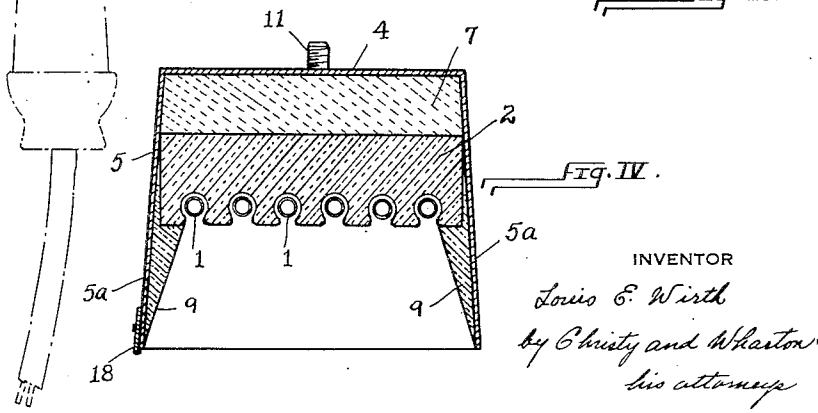


Fig. IV.

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Patented Sept. 2, 1941

2,254,925

UNITED STATES PATENT OFFICE

2,254,925

PAINT DISINTEGRATOR

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Application March 30, 1939, Serial No. 264,951

5 Claims. (Cl. 219—29)

This invention relates to heat supplying apparatus useful in the disintegration of films of paint or varnish preparatory to their removal.

In removing coatings of paint or varnish which have deteriorated because of age, or which it is for any reason desired to remove from the surfaces of walls, floors, or ceilings of buildings, it has been customary to use blow torches. In using blow torches, painters project a flame against the surface of the paint or varnish coating to disintegrate the film of paint or varnish, and follow this procedure by scraping the film from the underlying surface to which it has adhered. There are certain disadvantages to the use of a blow torch in this manner. One such disadvantage is that the area contacted, or directly affected, by the flame of a blow torch at any instant is very restricted, and the operation of disintegrating and removing a coating of paint or varnish from an extended surface is, therefore, slow.

Other disadvantages reside in the fact that a naked flame produced by the blow torch is the ultimate means for disintegrating the coating. The surfaces from which the coating or paint or varnish is to be removed are quite frequently wood, and, therefore, if the flame is allowed to impinge too long upon the surface, it tends seriously to injure the wood by charring. There is also danger that in operating at joints between a window or door frame and the adjacent surface of a wall, the flame may strike into a gap or crack and ignite highly inflammable material within the wall structure. Probably, however, the greatest disadvantage of an open flame is that workmen, frequently being upon ladders or otherwise insecurely supported, in their work may, by slipping or falling, suffer injury from the flame of the torch.

My apparatus is of a sort to avoid the dangers attendant upon the use of a blow torch, and additionally, to expedite the disintegration of a coating of paint or varnish in a manner to permit it readily to be scraped from an underlying surface.

Primarily considered, the organization of my apparatus by which the desired advantages are obtained, consists of the mounting and arrangement of an electrical heating element in such manner that heat from the electrical heating element may readily and successfully be presented to a coating of paint or varnish, to perform in superior manner the function previously performed by blow torches in removing such coatings.

In the accompanying drawing, illustrating an exemplary embodiment of my invention, Fig. I is a side elevation of my disintegrating apparatus. Fig. II is a plan view of the apparatus shown in Fig. I, illustrating in dotted lines the adjustability of the body of the said apparatus with respect to the supporting means therefor. Fig. III is a central longitudinal sectional view through the body of the apparatus. Fig. IV is a cross-sectional view taken in the plane of the section line IV—IV of Fig. III.

The heat generating means of the disintegrating apparatus is in the form of a resistance element designated by reference numeral 1 consisting of a plurality of lengths of coiled heavy duty resistance wire, such as a heavy-duty "Nichrome" resistance coil. The lengths of the wire are interconnected, and are arranged in a common plane and desirably parallel to each other. The mounting for the electrical resistance element is a refractory block or brick 2, and is of a material such as magnesite commonly used for such refractory structures. The lengths of the resistance coil lie in closely spaced channels separated from each other by narrow ridges of the refractory material, and extend approximately from end to end of the block. Because of the close spacing of the lengths of the coil the resistance element presents a maximum of heat emission within a restricted area. This concentration of heat-radiating material within a restricted area in a single plane is a feature of primary inportance in effecting the purpose of my invention.

The heating assembly is mounted for projection of heat within an approximately rectangular casing of metal, or other suitable material, including a back wall 4 and side and end walls respectively designated 5 and 6. Lying within the casing between refractory block 2 and the back wall 4 of the casing is an insulating filler 7 of magnesia or other suitable heat-insulating material for heat and for electricity. The refractory block 2 of the heat generating assembly is held against this filler 7 by means of screws 8 threaded in the end walls 6 of the casing and lying in notches at the ends of the refractory block. Heating coil 1 is thus presented toward the open end of the casing, and lies with all its turns in a plane spaced from the plane in which the edges of the four casing walls lie. Along the inner surfaces of the portions of the casing walls 5 and 6 which project outwardly beyond the heating coil, and which provide heat-concentrating skirts 5a and 6a, is a heat-insulating lining 9 of fire-proof cement.

A handle 10 for supporting the heating assembly in service is swingingly mounted at the back wall 4 of the assembly casing, and is extended at an angle to the plane of the back wall. As shown, this mounting is provided by a screw 11, the shank of which is projectant outwardly from the back wall of the casing and carries a nut 12. Handle 10 has a flattened apertured portion 10a through which the shank of screw 10 passes, so that the handle is rotatably confined between the back wall 4 of the casing and the nut 12 on the screw.

Desirably, as shown, current supply conductor wires 13 and 14 are housed in the handle 10, and are under the control of a switch 15 included in the structure of the handle. These conductors issue from the handle in a region adjacent the casing for the heating assembly, and in an electrically insulated housing 16 mounted on the back wall 4 are brought to two connectors, one of which is shown, and is designated by reference numeral 17. There is slack in the reach of the conductors between the point at which they issue from the handle and the point at which they enter the housing 16 in order to permit swinging movement of the handle for angular adjustment with the casing. Conductor wires 20 pass through the heat insulating filler 7 and through channels in the refractory block 2 to connection at opposite ends of the heating coil 1.

Desirably, a strip 18 of steel, or other suitable material, is engaged to the outer face of the heat concentrating skirts of the casing to project slightly beyond the edge thereof. The purpose of this strip is to provide means against which a knife used in scraping disintegrated coatings from surfaces being cleaned may be scraped clean of paint or varnish, and sharpened, without materially interrupting the progress of the work.

In an operation of removing coatings of paint and varnish, utilizing my disintegrating apparatus, current is directed through the resistance element 1, and the apparatus is moved over the coating of paint or varnish which is to be removed to disintegrate the coating. I have found that the temperature within the heat-insulated skirts of the apparatus varies in service from about 850° F. to 1100° F., in accordance with the wattage supplied by the circuit in which the apparatus is connected. In accordance with the temperature, and the character of the coating which is to be removed, the disintegrating apparatus is passed at an appropriate speed along the surface, and is spaced from the surface an appropriate distance.

In average practice I have found that the disintegrator may be passed quite rapidly along the surface and that the edges of the casing skirts may desirably be spaced one inch, or more, from the surface. Such spacing permits the escape of volatilized constituents of the coating and usually the concentration of heat from the resistance element is sufficient to permit such spacing without retarding progress of the operation. Because of the origin of the heat utilized for disintegration, the volatilized constituents of the disintegrated coatings are not frequently ignited, as when blow torches are employed for the like purpose. In working within doors, there is not with my disintegrating apparatus, as with a blow torch, danger of igniting inflammable vapors, such as the vapors of varnish remover, turpentine, or the like, or the danger of igniting explosive mixtures. In outside work, there is no projected flame, as in a blow torch, which may be blown out, or deflected by wind from the work. In working, the operator follows the progress of the disintegrating apparatus with a scraping knife, readily removing the coating disintegrated by heat from the disintegrator. Because of the flameless nature of my disintegrating apparatus, an operator may closely follow the progress of the disintegrator with a scraping knife, without danger of burning his hand.

It will be noted that the casing of the disintegrator is of elongate rectangular form and it has been observed that the heating element is localized in a common plane corresponding in its horizontal dimensions and contour approximately to the dimensions and contour of the casing. While it is not essential, in order to obtain disintegration of coatings that the heat generating and projecting organization be in the form of a rectangle, I have found that it is a matter of substantial advantage to make it in that form, or in general approximation to it. A circular casing does not lend itself to a uniform application of heat from a resistance element within the casing in all regions of a path in which the apparatus is moved. That is, a circular form would tend to concentrate the heat along one diametric line of the heating element, whereas in a rectangular form, as the apparatus moves, all points in the width of its path of movement are subjected for an equal time to the heating effect. A rectangular contour, and particularly an elongate rectangular contour, is adapted to provide uniform heat distribution throughout a path of travel of the apparatus, and is well adapted to variation in the application of the heating effect. Thus, in work upon an extended surface, it is usually desirable to move the casing in a path at right angles to its longer dimension, while in working about door and window frames, and like structures, it is usually desirable to move the casing in a direction parallel with its longer dimension. In such edge work, the straight-line edge of the disintegrator may be made to coincide accurately with the straight edge of a door frame, or other trim.

The angular adjustability of the disintegrator handle is a matter of substantial advantage. This is because it permits the operator to make adjustment to the position of his arm which is most convenient for him under the circumstances of the work, to keep his arm out of his line of vision to the work, and also permits adjustment to irregular paths of movement of the disintegrator which the contour of the pointed or varnished surface being treated may impose.

In use, the heating effect is concentrated by the compact structure and mounting of the resistance element in which the heat is generated, and by the heat insulating and concentrating screens, provided by the heat-insulated skirts dependent beyond the resistance element. Because of this heat concentration within the ambit of the apparatus casing, the area in which disintegration is effected is approximately coincident with the area at the open side of the casing. The temperature being thus made adequate within that area, it is possible effectively to move the disintegrating apparatus along the coating of paint or varnish with relatively great rapidity, and an area of the coating equal to the entire width of the cased heating element of the disintegrator may be scraped off. This being so, the greater area heated at any instant by the flame from a blow torch, gives an accelerated removal of paint or varnish coatings. The factors of safety associated with the use of my disintegrating apparatus as compared with the use of a blow torch, have been above explained.

While purposed primarily as apparatus for disintegrating paint and varnish coatings in preparation for their removal from an underlying surface by scraping, and while designated herein as a disintegrating apparatus, my apparatus is susceptible of use for variant purposes. For example, it may be used to soften thermoplastic and fusible materials, and is particularly advan-

tageous for that purpose if such materials be combustible. If desired, the disintegrator may be used to promote rapid drying, by evaporation, of a newly applied film of paint or varnish. For such latter use, it is desirable that the control switch in the apparatus be given an intermediate position in which current passed to the resistant coil is of decreased value to create a lower temperature adjacent the open side of the apparatus; thus to avoid necessity for spacing the apparatus an inconveniently great distance from the surface which is to be dried. Other advantageous uses of my apparatus readily will occur to those skilled in the art of removing and applying coatings of paint or varnish, and to those skilled in the arts using thermoplastic and fusible materials.

I claim as my invention:

1. Disintegrator apparatus for paint and varnish coatings adapted to be progressed over a surface so coated while manually supported in spaced relation thereto organized as an oblong housing of light structure and relatively small dimensions having side walls and a back wall, an exposed high-temperature electrical resistance structure capable of creating a temperature of from about 850° F. to 1100° F. within the housing occupying a horizontal plane area arranged within the ambit of the housing side walls and insulated in the housing, and a handle projectant from the back wall of the housing to form an angle of less than 45 degrees with the plane of the said resistance structure so that an operator conveniently holds the resistance structure parallel to the surface over which it is moved, said angularly projectant handle being rotatably adjustable about an axis perpendicular to the plane of the said resistance structure so that the relation of an operator's grasp of the apparatus is conformable to the direction in whch the disintegrator apparatus is moved, and to the angular adjustment of the disintegrator to move over the surface being treated in a path of regulated width.

2. Disintegrator apparatus for paint and varnish coatings adapted to be progressed over a surface so coated while manually suppored in spaced relation thereto organized as an oblong housing of light structure and relatively small dimensions having side walls and a back wall, an exposed high-temperature electrical resistance structure capable of creating a temperature of from about 850° F. to 1100° F. within the housing occupying a horizontal plane area arranged within the ambit of the housing side walls and insulated in the housing, a handle projectant from the back wall of the housing to form an angle of less than 45 degress with the plane of the said resistance structure so that an operator conveniently holds the resistance structure parallel to the surface over which it is moved, said handle being rotatably adjustable about an axis perpendicular to the plane of the said resistance structure so that the relation of an operator's grasp of the apparatus is conformable to the direction in which the disintegrator apparatus is moved and to the angular adjustment of the disintegrator to move over the surface being treated in a path of regulated width, electrical conductors for supplying current to the said resistance structure housed in the said handle, and a switch carried by the said handle and arranged to control current supply by way of the said conductors to the said resistance structure.

3. Disintegrator apparatus for paint and varnish coatings adapted to be progressed over surfaces so coated while manually supported in spaced relation thereto organized as an oblong housing of light structure and relatively small dimensions having side walls and a back wall, an high-temperature electrical resistance structure consisting of an insulating block having electrical resistance coils thereon removably mounted within the ambit of the housing side walls partway of the housing depth, insulating packing between said electrical resistance structure and the back wall of the housing, and a handle projectant from the back wall of the housing to form an angle of less than 45 degrees with the plane of the said resistance element, and rotatably adjustable about an axis perpendicular to the plane of the said resistance structure so that the relation of the operator's grasp of the apparatus is conformable to the direction in which the disintegrator apparatus is moved over the said surface, and to the angular adjustment of the disintegrator to move over the surface being treated in a path of regulated width.

4. Disintegrator apparatus for paint and varnish coatings adapted to be progressed over a surface so coated while manualy supported in spaced relation thereto organized as an oblong housing of light structure and relatively small dimensions having side walls and a back wall, an exposed high temperature electrical resistance structure capable of creating a temperature of from about 850° F. to 1100° F. within the housing occupying a horizontal plane area arranged within the ambit of the housing side walls and insulated in the housing, and a handle projectant from the back wall of the housing to form an acute angle with the plane of the said resistance structure so that an operator conveniently holds the resistance structure parallel to the surface over which it is moved, said angularly projectant handle being rotatably adjustable about an axis perpendicular to the plane of the said resistance structure so that the relation of an operator's grasp of the apparatus is conformable to the direction in which the disintegrator apparatus is moved, and to the angular adjustment of the disintegrator to move over the surface being treated in a path of regulated width.

5. Disintegrator apparatus for paint and varnish coatings adapted to be progressed over surfaces so coated while manually supported in spaced relation thereto organized as an oblong housing of light structure and relatively small dimensions having side walls and a back wall, an electrical high temperature resistance structure consisting of an insulating block having electrical resistance coils thereon removably mounted within the ambit of the housing side walls partway of the housing depth, insulating packing between said electrical resistance structure and the back wall of the housing, and a handle projectant from the back wall of the housing to form an acute angle with the plane of the said resistance element, and rotatably adjustable about an axis perpendicular to the plane of the said resistance structure so that the relation of the operator's grasp of the apparatus is conformable to the direction in which the disintegrator apparatus is moved over the said surface, and to the angular adjustment of the disintegrator to move over the surface being treated in a path of regulated width.

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