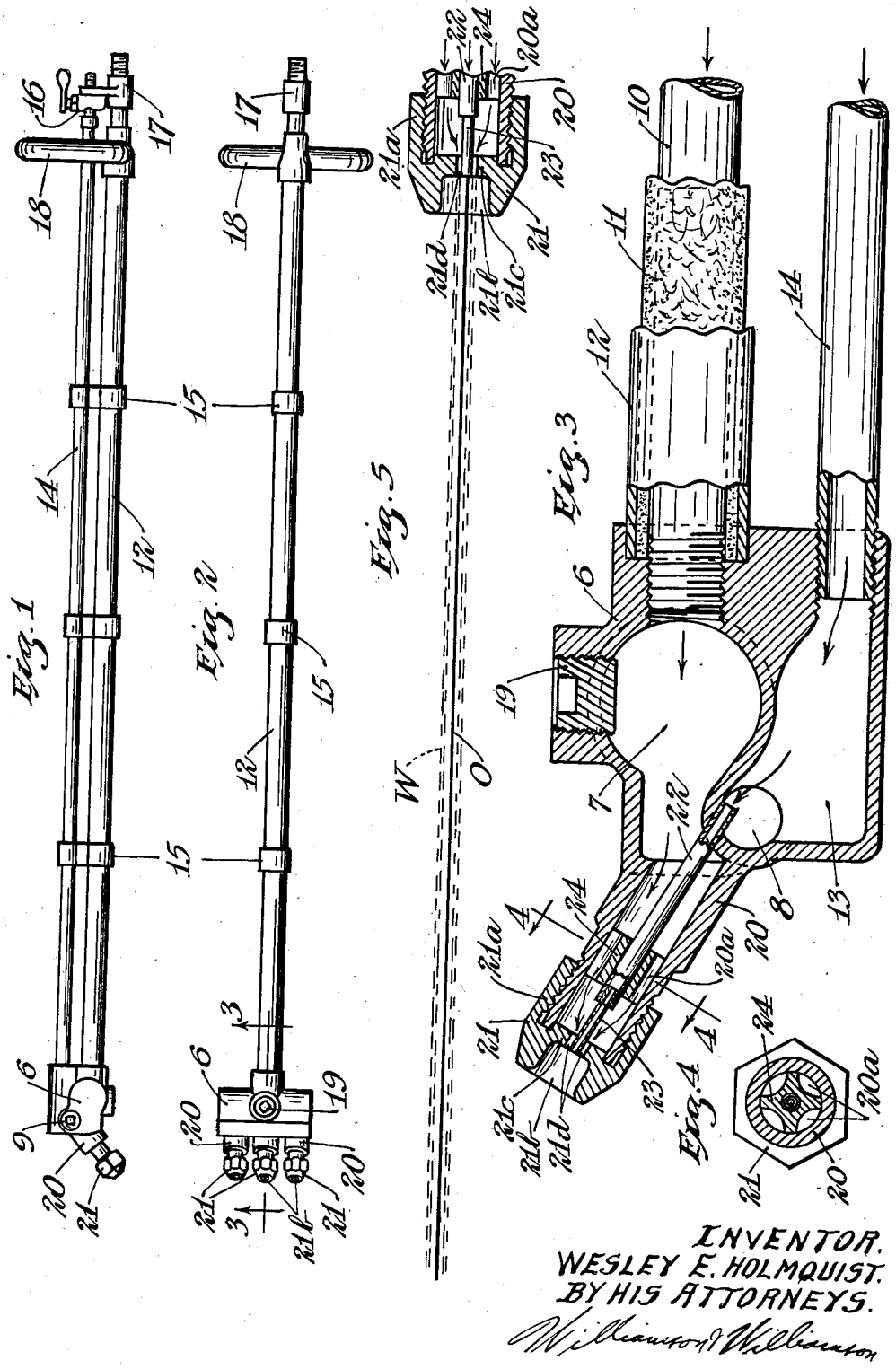
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PROCESS FOR CLEANING GREASY SURFACES

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## PROCESS FOR CLEANING GREASY SURFACES

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2 Claims. (Cl. 87—5)

This invention relates to processes for cleaning grease and oil and oily and greasy dirt from such machines as locomotives, automobiles, engines etc. As is well known, the oil and grease used to lubricate such machines spread more or less over the parts thereof and catch dust and dirt. This accumulation becomes more or less hard and attached to the surfaces and it is quite difficult to remove.

It is the primary object of the present invention to provide novel and improved processes for cleaning greasy surfaces, which will quickly cut or dissolve grease from such surfaces and will wash away the grease together with any dust or dirt that may be clinging to such surfaces.

The objects and advantages of the invention will be fully set forth in the following description, made in connection with the accompanying drawing, which illustrates a grease cleaning gun adapted to be used in carrying out my processes, like reference characters referring to similar parts throughout the various views of the drawing, and in which,

Fig. 1 is a view in side elevation illustrating a grease cleaning gun that may be used;

Fig. 2 is a bottom view of the gun shown in Fig. 1;

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 2, as indicated by the arrows;

Fig. 4 is a section taken on the line 4—4 of Fig. 3, as indicated by the arrows, and

Fig. 5 is a vertical section through the nozzle of the gun and illustrating the manner in which the stream of fluid is projected therefrom.

The grease cleaning gun illustrated, which is typical of a gun that may be used, in carrying out my processes, will be first described whereupon reference may be later had to this gun in describing the processes themselves.

The gun illustrated includes a block-like head 6 within which is formed a transverse water chamber 7 and a transverse oil chamber 8 separated from the water chamber and closed at its ends by plugs 9. Screw threadedly connected with the rear part of the head 6 to communicate with the water chamber 7 and supply the same is a water pipe 10 covered by an insulating sleeve 11 of insulating material, such as asbestos, this sleeve 11, in turn, being covered by a metallic tube 12. Communicating with a central cavern 13 in the head 6 and having screw threaded connection with the rear part of the head 6 is an oil pipe 14 which runs parallel to the water pipe 10. Spaced brackets 15, through which the sleeved pipe 10 and the pipe 14 extend, hold the two pipes in assembled spaced, parallel relation. The rear end of the water pipe 10 is screw threaded to receive a hose connection (not illustrated) running from a source of hot water to supply hot water to the pipe 10 under pressure. The rear end of the pipe 14 is also screw threaded to receive a hose running from a source of oil supply. Preferably near the rear end of the pipe 14 a control valve 16 is provided in the oil pipe to regulate the supply of oil therethrough. Attached to the rear portion of the water pipe 10 is a bracket 17 having an arm provided with an opening receiving the rear portion of the oil pipe 14. Also mounted on the water pipe 10 near its rear end is a rectangular-shaped handle 18 which may be grasped by one hand of the operator of the gun.

The cavern 13 of course communicates with the oil chamber 8 to supply oil thereto from the oil pipe 14. Preferably a removable plug 19 communicating with the water chamber 7 is provided, this plug being received within an apertured screw-threaded bossed portion of head 6. A number of nozzle necks 20 communicating with the water chamber 7 project forwardly and downwardly from the front of the head 6 and these necks near their outer ends are exteriorly screw-threaded to receive nozzle caps 21. These nozzle caps 21 each have a rearwardly extending skirt portion 21*a* of polygonal exterior to receive a wrench and of screw-threaded interior construction to be received on a nozzle neck. The forward end portion of each nozzle cap is quite heavy and is recessed at 21*b* to form a transverse wall 21*c* between the interior of the nozzle neck 20 and the recess 21*b*. A central opening 21*d* of considerably less diameter than the diameter of the recess 21*b* is provided in the wall 21*c*.

Straight tubes 22 communicating at their rear ends with the oil chamber 8, anchored near their rear ends in the head 6 and projecting forwardly through the central portions of the nozzle necks 20 are provided, and these tubes are received near their forward ends within spiders 24 mounted within the nozzle necks 20. The tubes 22 have, telescopically received and anchored in their forward ends, forwardly projecting smaller tubes 23 which extend through the central openings 21*d* of the nozzle caps and terminate at their forward ends approximately flush with the outer surfaces of the walls 21*c* of the nozzle caps. It should be noted that channels 20*a* are provided between the internal walls of the nozzle necks 20 and the spiders 23 mounted therein, so that water may

pass freely from the water chamber 7 to the openings 21*d* in the nozzle caps, these channels while permitting the passage of water acting to prevent whirling action of the water. It should further be noted that the diameter of the small tubes 23 is considerably less than the diameter of the openings 21*d*, so as to permit passage of a much larger quantity of water through the openings 21*d* than oil through the small tubes 23.

It should be further noted that the recess 21*b* in each nozzle cap is merely provided so that the outer portion of the nozzle cap will act as a guard to prevent injury to the tip of the tube 23 within the opening 21*d* of the cap. The recess 21*b* is of such size that water ejected through the opening 21*d* will not come in contact with the sides of the recess and, of course, neither will oil ejected from the tube 23. As the tip of the tube 23 lies approximately flush with the outer surface of the wall 21*c*, no mixing action can take place between water and oil ejected respectively through the opening 21*d* and the tube 23 until after this water and oil has been emitted from the nozzle.

In using the gun for carrying out the processes of my invention, hot water of a temperature from 125° to 140° F. will preferably be used for supplying the pipe 10 and this water will be charged into the pipe 10 as from a rubber hose under a pressure of from 125 to 140 pounds per square inch. Although as stated, it is preferable to use hot water, it is possible to use cold water or water at lower temperature than 125° F., but less effectively. Oil such as distillate, fuel oil or gas oil will be supplied as from a rubber hose to the oil pipe 14 under a pressure of from 3 to 10 pounds per square inch. The operator will grasp the handle 18 with one hand and the forward part of the gun with the other hand and will hold the nozzle preferably from 1 foot to 5 or 6 feet from the greasy surface, such as a surface on a locomotive to be cleaned. The valve 16 having been opened, water will be ejected under high pressure from the various openings 21*d* of the gun and oil will be ejected from the tips of the tubes 23 of the gun. The oil is ejected in jets from the tubes 23 within streams of water, the water stream annularly surrounding the jet of oil to carry the oil with the water stream within the interior of the water stream. When under normal operation, approximately 17 to 18 gallons of water per minute will be discharged from a gun while 1 pint of oil is being discharged. In other words, the volume of water discharged to oil discharged is from greater than 100 parts water to one part oil and may be as low as 135 to 144 parts water to 1 part oil. The oil jet within the water stream preserves its identity without mixing to any appreciable extent with the water until the combined stream of water and oil strikes the greasy surface, i. e. the oil remains in practically undiluted and unmixed condition and in unemulsified state until after the greasy surface is impacted. The oil in practically pure state, therefore, strikes the greasy surface and acts as a solvent for the grease on this surface while the water striking the surface washes away the oil and grease and the dirt loosened by reason of the solvent action of the oil. By reason of the fact that the oil is maintained in jet form within the stream of water until the oil contacts the greasy surface and the oil and water do not mix to an appreciable extent until after the surface is contacted, it is possible to use but very small quantities of oil relative to water for effective cleaning of the greasy surface. The peculiar manner of discharge of the oil jet and the water stream from the nozzle is illustrated in Fig. 5 wherein the dash lines W designate the water stream while the solid line O designates the oil jet. It is found in actual usage of the process that the oil jet O will preserve its identity independent of the water stream W for a distance of from 8 to 12 feet from the nozzle of the gun. That this is true has been proven under working conditions by using a colored oil and observing the color of this oil jet relative to the uncolored water surrounding the oil jet.

Of course, the pressure of the water striking the greasy surface serves to assist the oil in loosening the grease and dirt from the surface. After the surface is struck by the combined oil jet and water stream, naturally the oil and water mix by reason of the impact against the greasy surface and thereafter the oil and water to at least some extent go into colloidal solution. This colloidal solution is not formed however until after the practically undiluted oil has dissolved the grease on the greasy surface. If the oil and water is highly mixed or emulsified before striking the greasy surface, a much higher ratio of oil to water must be used than in my process to produce anything like comparable results. This has been proven to be true under actual tests.

It will, of course, be understood that various changes may be made in my processes and in the equipment for carrying out my processes without departing from the scope of my present invention, which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:—

1. The process of cleaning a dirty, greasy surface which consists in projecting against the surface a single stream composed of water and a grease dissolving mineral oil only, the volume of oil relative to water being less than 1 to 100 and the water being under a pressure of from 125 pounds to 140 pounds per square inch and the water carrying within it the oil at the pressure of the water in a substantially undiluted jet, said water and oil remaining in unemulsified and largely unmixed state until after impacting said surface whereby the jet of oil acts in substantially pure state as a solvent for the grease on the greasy surface to loosen any dirt on the surface and the water acts immediately at the point where the oil jet is directed to wash away both the grease and the dirt.

2. The process of cleaning a dirty, greasy surface which consists in projecting against the surface a single stream composed of water and a grease dissolving mineral oil only, the volume of oil relative to water being less than 1 to 100 and the water being under a pressure of from 125 pounds to 140 pounds per square inch and the water being at a temperature of from 125 to 140° F., the water carrying within it the oil at the pressure of the water in a substantially undiluted jet, said water and oil remaining in unemulsified and largely unmixed state until after impacting said surface whereby the jet of oil acts in substantially pure state as a solvent for the grease on the greasy surface to loosen any dirt on the surface and the water acts immediately at the point where the oil jet is directed to wash away both the grease and the dirt.

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