

July 3, 1962

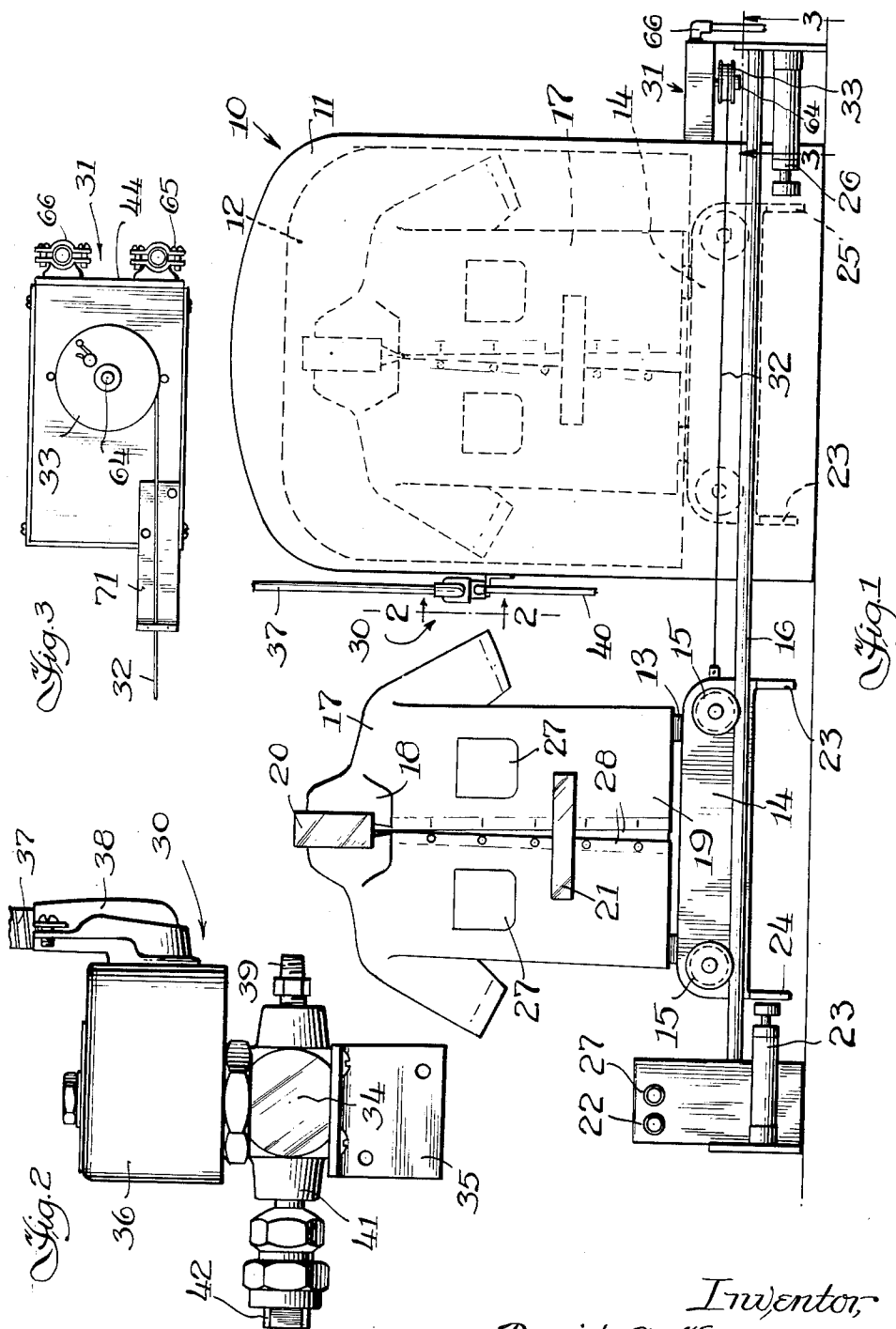
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3,042,274

AUTOMATICALLY OPERATED SPRAYING APPARATUS

Filed Nov. 13, 1959

3 Sheets-Sheet 1



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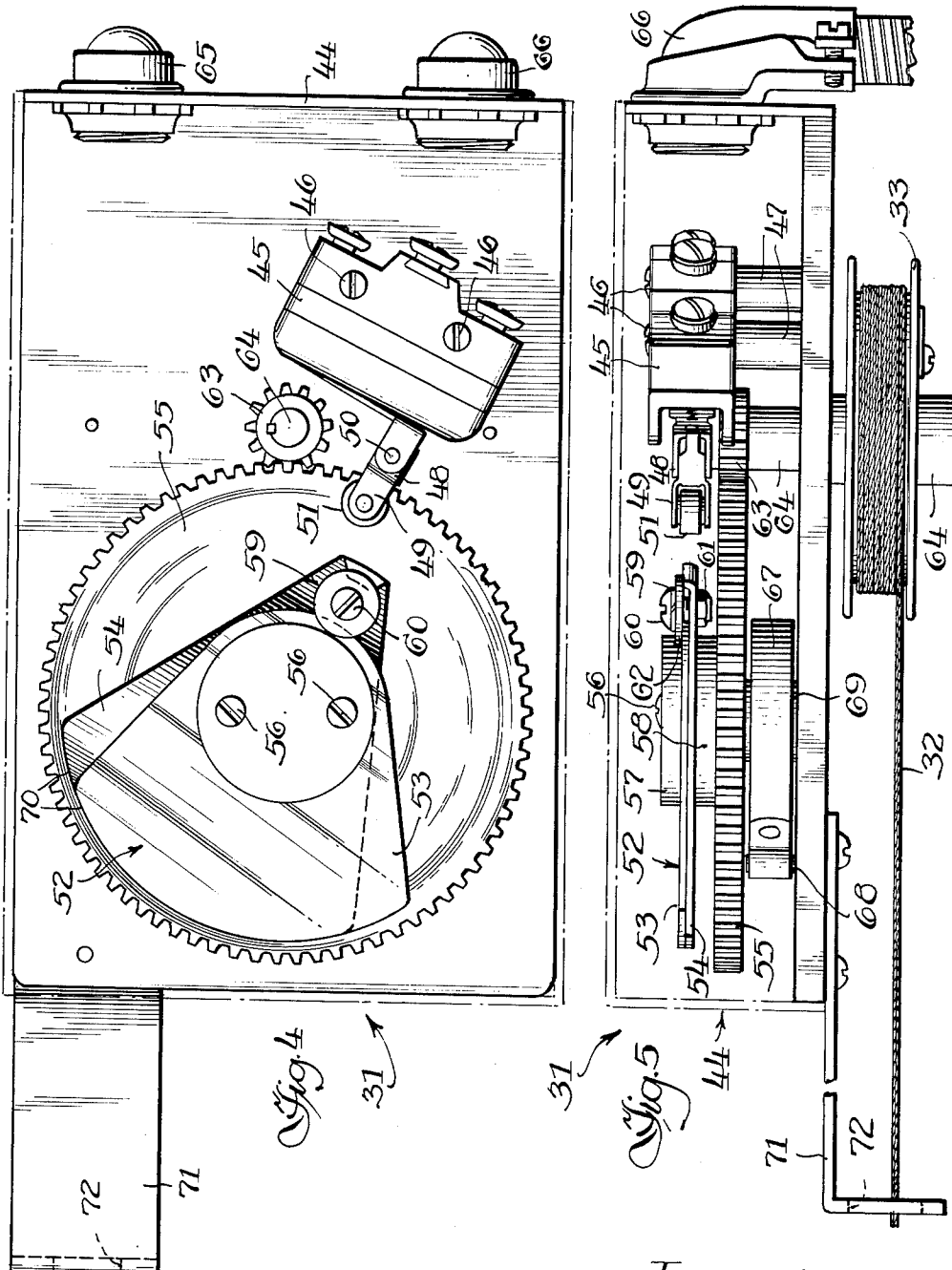
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

Fig. 6

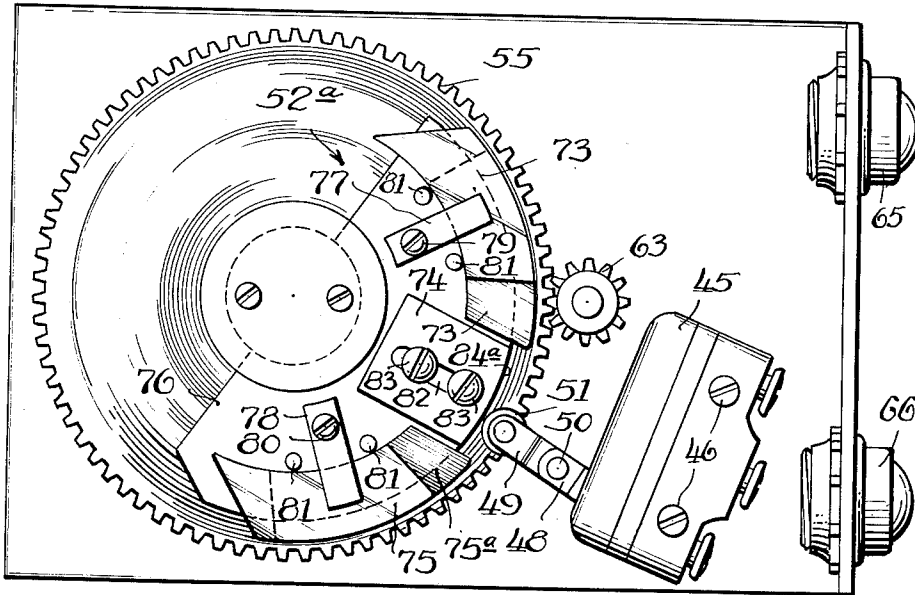
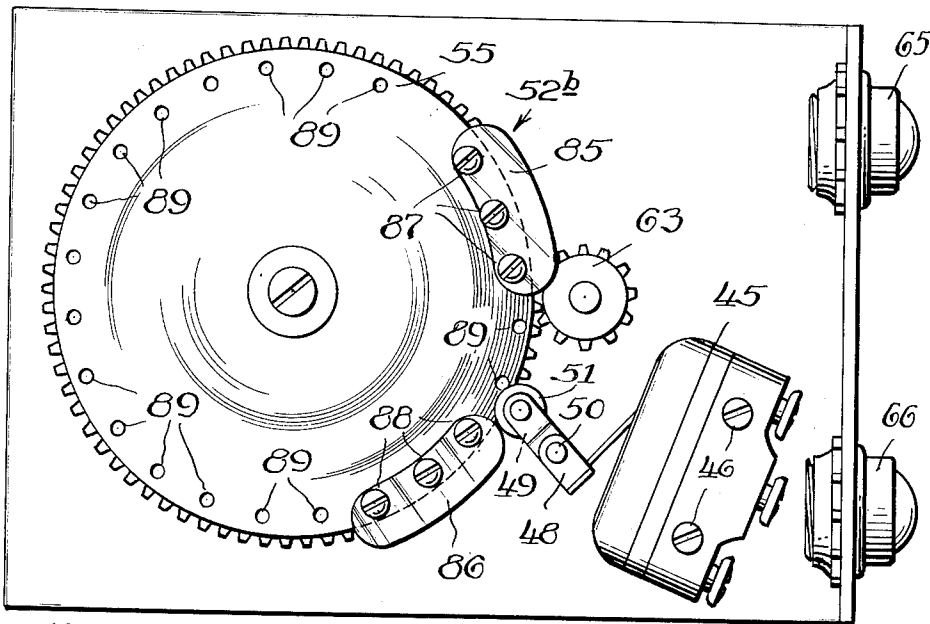


Fig. 7

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3,042,274

AUTOMATICALLY OPERATED SPRAYING APPARATUS

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11 Claims. (Cl. 223-57)

The present invention relates to a spraying system and more particularly to an automatically operated spraying system.

Spraying systems embodying the present invention have general utility but are illustrated and described in the following specification and in the drawings forming a part of this specification in connection with a cabinet type garment press as an illustrative embodiment and utilization of the present invention.

There are innumerable forms of cabinet type garment presses. Most cabinet presses have many characteristics and structural features in common. Generally, they are equipped with a body form buck which may be an inflatable and expandable cushion on which the garment, such as a shirt, is disposed for simultaneous pressing of the bosom and back portions of the garment. There may be more than one such body form buck in the press, but for purposes of the present invention the number of bucks in the press is immaterial.

The buck or body form of the press is usually mounted on a carriage for reciprocating movement into and out of the cabinet of the press through an open access way at the side of the cabinet. Numerous forms of moving means for the carriage and the buck have been employed. These include short stroke pneumatic pistons at opposite ends of the track for the carriage. The pistons strike the carriage and cause the same to slide or roll to the opposite end of the track. Other forms of buck moving means include pneumatic or hydraulic full stroke piston-cylinder assemblies, electric or solenoid actuated, short-stroke units which act in the same manner as the short stroke pistons described above, and motor means for driving the carriage along the track through any convenient transmission such as a chain or a rack and pinion assembly.

Within the cabinet of the press unit there are usually two press heads for pressing the back and bosom of a garment, respectively. The press heads stand in parallel spaced relation to each other with a space between the press heads to receive the body form buck with a garment thereon. In many units the press heads are movable toward each other to engage the garment on the buck and press the same. In many other units the buck is inflatable and expandable to press the bosom and back of the garment against the press heads. In still other units, both of the aforementioned arrangements are employed so that the buck expands and the press heads move toward each other into engagement with the garment on the buck.

In normal operation the operator of the machine, when pressing a shirt, places a shirt on the body form buck, buttons the collar and clamps the collar and the tail in place. When the shirt is in place on the body form, the operator actuates the machine by pressing a start button. This causes the drive for the carriage on which the body form is mounted to move the body form through the access way of the cabinet and into the space between the press heads. When the body form buck is in place between the heads, the machine automatically causes the bosom and back of the garment to be pressed by pressure engagement of the garment between the buck and the press heads in the manner in which the machine is designed to operate, such as by movement of the press heads

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against the buck and/or inflation and expansion of the buck.

After a predetermined pressing time interval the garment is automatically released from the press heads.

5 Thereafter the buck is removed from the cabinet by reverse reciprocating movement along the track, either automatically or by energization of a return mechanism by the operator.

The pressing of the bosom and back portions of a shirt in a cabinet type press forms only one of several steps required to properly complete the finishing of a shirt. The sleeves are pressed in an independent operation, the cuffs and collar are pressed in an independent operation and the shirt is folded in an independent operation. As a general rule the sleeves, cuffs and collar are all pressed before the bosom and back of the shirt are pressed. These prior pressing operations often result in predrying the bosom and back portions of the shirt, leaving dry wrinkles in the shirt. While the steaming which occurs in the cabinet type press and the stretching effected by the buck are usually sufficient to remove the wrinkles from the single thickness portions of the bosom and back, they are not sufficient to remove dry wrinkles from the multiple thickness portions such as the button strips and the pockets. Therefore, it has been found to be important to dampen the pockets and button strip, as a supplementary operation, immediately prior to entry of the shirt into the space between the press heads of the cabinet press while the shirt is on the body form buck.

30 The supplementary dampening operation may be effected in a number of ways. Heretofore this has been done primarily by manual operations which include either spraying the selected portions of the shirt with water from a manually operated nozzle, or hand or cloth or sponge dampening the selected portions of the shirt.

In accordance with the present invention, the cabinet press may be equipped with a spraying system which will automatically spray selected portions of the shirt for supplementary dampening thereof in a unique, synchronously timed operation co-ordinated with the movement of the body form buck into the space between the press heads.

An appropriate embodiment of the present invention for the aforementioned purpose includes a solenoid actuated valve and spray nozzle connected to a source of spraying medium, such as water, and mounted on the cabinet of the press adjacent to the access way for movement of the body form buck into and out of the space between the press heads. The solenoid for the valve is controlled by a switch mounted in a timing mechanism arranged to co-ordinate and synchronize energization of the solenoid with movement of the body form buck so that the selected areas of the shirt which are to receive supplementary dampening are effectively sprayed only as the shirt passes through the access way into the cabinet and so that only the selected areas of the shirt receive supplementary dampening.

The timing device includes a rotatable cam mounted in effectively spaced relation with respect to the switch so that the contoured cam surface engages a cam follower that is coupled to the switch arm for operation of the switch. Elongated means such as a cable or chain or string or other ligature, couples the cam to the carriage for the body form buck and winds on a drum which is spring biased to rewind the ligature on the drum as the carriage moves toward the timing mechanism and to permit the ligature to be unwound from the drum as the carriage moves away from the drum. The drum and the cam are co-rotatable, and in an embodiment of this invention may be coupled together through a gearing arrangement having a ratio selected so that the rotations of the drum as the carriage moves through its full reciprocating

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cating stroke effect one or less than one complete revolution of the rotatable cam.

The cam employed in embodiments of this invention may be a fixed cam for spraying a predetermined, selected area of the shirt or it may be an adjustable cam for spraying either a single area or selected spaced areas of a shirt.

To prevent energization of the solenoid valve during return movement of the reciprocating body form buck from its position between the press heads to its position outside of the cabinet, in an embodiment of this invention the switch is equipped with a spring biased, hinged actuating arm provided with a cam follower arranged so that the switch is closed when the cam rotates in one direction and hingedly permits movement of the cam in the opposite direction without closing the switch.

Moreover, systems embodying the present invention may be employed with multiple buck presses and may be employed to spray both the bosom and the back of the shirt, as desired. When using a plurality of bucks, an equal plurality of timers are employed so that there is one timer coupled by a ligature to each buck with the several switches of the timers connected in parallel with such an arrangement, the solenoid spray nozzle will be energized when any one switch is closed and thus spray as each body form buck moves past the nozzle.

When it is desired to spray both the bosom and the back of the shirt, a pair of solenoid operated valve and spray nozzles are used with one at each side of the access way to the cabinet. In latter arrangement the solenoids for the valves are connected in parallel so that they spray simultaneously and may be operated from a single timer.

Numerous other advantages and features of a spraying system embodying the present invention for spraying a moving member at selected intervals in timed relation with the member will become readily apparent from the following detailed description of the invention, from the claims, and from the accompanying drawings in which there is shown an illustrative embodiment of the invention, in which like reference numerals refer to like parts, and in which:

FIGURE 1 is a partially elevational and partially diagrammatic illustration of a common form of bosom and back press having a spraying system embodying the present invention mounted thereon for synchronized and coordinated operation therewith;

FIGURE 2 is a fragmentary illustration of a solenoid valve and spray nozzle arrangement embodying the present invention and viewed substantially along the line 2—2 of FIGURE 1;

FIGURE 3 is a bottom view of the timer and switch control arrangement of the system shown in FIGURES 1 and 2;

FIGURE 4 is a top plan view of the timer of FIGURE 3 with the top cover removed;

FIGURE 5 is a side elevational view of the timer with the side of the enclosure box removed;

FIGURE 6 is a top plan view of another embodiment of the timer incorporating the principles of this invention; and

FIGURE 7 is a top plan view of still another timer embodying the present invention.

An exemplary form of a bosom and back press arrangement or a cabinet press, as it is sometimes known, is indicated generally at 10 in FIGURE 1. The cabinet press 10 has a cabinet enclosure 11 with a pair of press heads 12 therein. The press heads 12 are mounted in parallel spaced relation to each other and are movable toward and away from each other within the cabinet 11.

In the normal non-pressing state of the press heads 12, the heads stand in spaced relation to each other with a space therebetween to receive a body form buck 13 mounted on a reciprocating movable carriage 14. The carriage is provided with rollers or wheels 15 cooperatively arranged with a track 16 that extends parallel to

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the press heads 12 throughout the transverse length of the cabinet 11 and for a substantially equal length outside of the cabinet.

As described above, during normal operation of the cabinet press, the operator places a shirt 17 on the body form buck, buttons the collar 18 of the shirt and clamps the collar 18 and the tail 19 with appropriate clamps 20 and 21, respectively, which hold the collar and the tail of the shirt in place on the body form buck 13. The operator then presses a button 22 which energizes the control system for the cabinet press causing actuation of the piston 23 at the outer end of the track. The piston is of the short stroke variety and strikes a depending arm 24 on the carriage 14 causing the carriage to roll along the track 16 through an access way provided in the side of the cabinet. When the carriage carrying the body form buck 13 with a shirt 17 thereon fully enters the space between the press heads 12, it is stopped by any convenient means such as abutment of a second depending arm 25 against a second or return piston 26 disposed at the opposite side of the cabinet from the access way.

At this time the press is actuated to press the bosom and back of the shirt by movement of the press heads 12 against the bosom and back, respectively, of the shirt 17, and/or inflation and expansion of the body form buck 13 by steam or air pressure.

At the completion of the pressing operation the shirt is released from engagement with the press heads and, either automatically or manually, the carriage is returned to its starting position outside of the cabinet. If manual operation is employed, a return button 27 is pressed by the operator to effect energization of the return, short stroke piston 26 to strike the depending arm 25 and push the carriage back to its original starting position.

If the pockets 27 and buttoning strip 28 are not properly dampened, they will contain dry wrinkles when the shirt is removed from the press even though they have been subjected to the substantially high pressing pressures of the press. A spray system embodying the present invention and mounted on the cabinet press for coordinated and synchronized operation and cooperation therewith for effectively dampening the pockets 27 and buttoning strip 28 is provided on the press 10.

The spraying system forming the embodiment of the invention shown in the drawings includes a solenoid operated valve and spray nozzle assembly 30 which is energized and controlled by a timing system 31. The timing and control system 31 is coupled to the carriage 14 for coordinated and synchronized operation and cooperation therewith, by a ligature 32, such as a cable or string or wire or chain, etc. which is wound on a drum 33 forming a part of the timing arrangement 31.

As the body form buck 13 with the shirt 17 thereon enters the access way in the cabinet to pass into the space between the press heads, the ligature 32 winds on the drum 33 whereby the timer so effectuates energization of the solenoid operated valve and nozzle arrangement 30, as to spray the pockets 27 and the buttoning strip 28 with a dampening medium such as water for effective dampening thereof to permit efficient and proper pressing of those parts. Timer arrangements embodying this invention may be arranged to spray either the pockets 27 or the buttoning strip 28 or both, or in the event that there is only one pocket, then to spray only that one pocket, as desired. The timing system is also arranged so that it does not effect energization of the solenoid operated valve and nozzle when the shirt is returned to its starting position and removed from the space between the press heads.

The solenoid operated valve and nozzle arrangement is shown in detail in FIGURE 2 wherein it is shown that the arrangement includes a valve 34 mounted on a bracket 35 permitting mounting of the entire assembly 30 on the

cabinet 11 adjacent to the access way for the body form buck. The valve 34 carries a solenoid actuator 36 which is connected to the timing arrangement 31 by wires carried in an armored sheath 37 and connected to the solenoid by an appropriate coupling 38.

The valve 34 has an inlet 39 connected to any desired source of dampening medium by any convenient means such as a pipe 40 shown in FIGURE 1. At the outlet end 41 of the assembly 30, it is equipped with a replaceable spray nozzle 42 which may be designed to give any desired appropriate spray pattern.

The timer arrangement 31 is shown in detail in FIGURES 3, 4 and 5. As described above, the timer includes the ligature winding and unwinding drum 33 carrying at least the slack portion of a ligature 32 utilized to couple the timer to the carriage 14 for synchronized and cooperative operation of the spraying system with movement of the body form buck and the carriage on which the buck is mounted.

The timer mechanism 31 is largely contained within a casing or housing 44 and is adapted for mounting at either end of the cabinet press. In the arrangement shown in FIGURE 1, the timer 31 is mounted at the opposite side or end of the cabinet 11 from the access way for the carriage 14. The timer housing 44 may be secured to the press mechanism in any suitable manner such as screws or bolts or the like.

Within the housing 44, the timer carries a switch 45 secured to the base of the housing by screws 46, seen in FIGURE 4, extending through spacing bushings 47 to hold the switch 45 in spaced relation to the base of the housing 44. The switch is provided with an arm 48 provided with a pivoted link end 49 which is pivoted to the arm by pivot pin 50 and spring biased to an extended position as shown in FIGURE 4. At the end of the link 49 there is a cam follower roller 51 which is disposed to engage the timing cam arrangement indicated generally at 52.

The timing cam arrangement 52, in this embodiment of the invention, includes a pair of substantially pie slice-shaped cams 53 and 54 adjustably secured to a gear 55 by screws 56 which clamp the cam plates between a clamp lock 57 and a hub 58 on the gear 55. In addition, the cam plates are adjustably clamped together by a screw and washer clamp 59 including a screw 60 having a nut 61 thereon and extending through an aperture in the lower cam plate 54. A washer 62 under the head of the screw 60 bears against the top of the upper cam plate 53 so that when the screw and nut are tightened, the cam plates are clamped together and held in place.

The gear 55 is intermeshed with a pinion 63 which is keyed to a shaft 64. The shaft 64 extends through the bottom of the housing and carries the winding reel 33. By this means, whenever the winding reel 33 rotates, the cam arrangement 52 will rotate by virtue of rotation of the gear 55.

When the cam actuates the timer switch, the switch will close to energize the valve 34. The solenoid 36 is connected to the switch by cable connections to a coupling 65 and to a power source by a cable connected to a coupling 66 at the outer end of the timer housing.

During movement of the buck into the space between the press plates 12, the cable will be wound on the reel. The winding of the cable onto the reel is effected by operation of a spring 67 having one end thereof fixed on a post 68 and the other end thereof connected to the center shaft 69 for the gear 55. The spring 67 is a clock-type spring and biases the gear 55 in an appropriate direction to maintain the cable 32 under tension on the drum 33 and to cause the drum to take up slack and rewind the cable 32.

As the cable 32 is wound on the drum 33 during movement of the buck 13 into the space between the press heads 12, the cam arrangement 52 will rotate in a clockwise direction as viewed in FIGURE 4. When the con-

toured edges 70 of the cam plates 53 and 54 engage the cam follower 51, the switch 45 will be closed causing energization of the solenoid 36, opening of the valve 34 and spraying through the nozzle 42. The duration of the spray will be determined by the combined length of the contoured cam faces 70 in their adjusted position as shown in FIGURE 4. Loosening the screws 56 and 60 permits movement of the cams 53 and 54 to have a greater or a lesser combined length, as desired.

As the shirt 17 is pressed, the buck 13 is returned to its starting position as shown in full lines in FIGURE 1 and the cam arrangement 52 is moved to its original position as shown in FIGURE 4 by unwinding of the cable 32. During movement of the cam plates 53 and 54 in the return direction, the switch 45 will not be closed by virtue of the lost motion arrangement of the link 49 pivoting about the pivot 50 against the force of the biasing spring contained between the link 49 and the arm 48. Thus, during return movement of the buck to its starting position, the pockets 27 and the button strip 28 are not resprayed.

It should be appreciated that the timer may be mounted at either end of the machine with the cams adjusted to energize the solenoid 36 for the valve 34 either as the cable is rewound on the drum or as the cable is unwound from the drum. In the embodiment of the invention shown in FIGURES 3, 4 and 5, the mechanism is also equipped with a cable guide bracket 71 having an aperture 72 therein through which the cable passes to insure proper mounting of the cable on the drum.

The guide bracket 71 and numerous other parts of the timer are not shown in the embodiments of the invention illustrated in FIGURES 6 and 7. In these figures, there are shown the switch 45 with the pivoted arm and link 48 and 49 thereon with the link carrying cam follower 51 and pivoted to the arm 48 by the pivot pin 50. There are also shown the gears 55 and 63 for rotation of the cam arrangements.

The cam arrangement 52a shown in FIGURE 6 is adjustable for spraying either or both pockets of the shirt, with or without spraying the buttoning strip. For this purpose, the cam arrangement 52a includes three movable cam sections 73, 74 and 75. The cam sections 73 and 75 are substantially symmetrical and are held on a cam mounting plate 76 by cam clamps 77 and 78 which are secured to the cam mounting 76 by screws 79 and 80, respectively. The radial positioning of the cam plates 73 and 75 is determined by a pair of located back-up pins 81 for each cam plate. Cams 73 and 75 control the spraying of the pocket portions of the shirt and are circumferentially adjustable to permit adjustment for the desired gap between the sprayed areas as controlled by the cams 73 and 75. Cams 73 and 75 are also provided with corresponding cams 73a and 75a, respectively, which are disposed under the cams 73 and 75 and backed by the pins 81 and held by the clamps 77 and 78, respectively. The cams 73a and 75a are provided so that the length of the spraying area is adjustable and controllable.

The cam 74 is disposed between the cams 73a and 75a and is radially adjustable by being provided with a slot 82 through which a pair of clamping screws 83 extend. By adjusting the cam 74 outwardly, the system can be arranged for actuation of the switch 45 for spraying the button strip area of the shirt. By adjusting the cam 74 inwardly, the arrangement can be set so that the button strip or central area of the shirt is not sprayed since the contoured cam edge 84 will not engage the follower 51 for the switch 45.

The cam arrangement 52b shown in FIGURE 7 employs removable and replaceable cam sections 85 and 86 which are clamped directly to the gear 55 by screws 87 and 88 received in threaded apertures 89 adjacent to the peripheral margin of the gear 55. Any number of such cam plates 85 and 86 may be disposed on the gear 55 and they may have any desired length of contoured

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edge for actuation of the switch 45 by engagement of the contoured edge of the cams with the follower 51. Thus, in this embodiment of the invention the spraying system may be caused to operate intermittently or continuously over the desired length of spray area, as desired.

Both of the embodiments of timing arrangements shown in FIGURES 6 and 7 may be readily substituted for the timing arrangements shown in FIGURES 3, 4 and 5 for inclusion in the system shown in FIGURE 1 and they will operate in the manner described hereinabove for spraying selected areas of the shirt or other garment on the body form buck 13, as desired.

From the foregoing it will be observed that numerous modifications and variations may be effected without departing from the true spirit and scope of the novel concepts and principles of this invention.

I claim:

1. In combination with a moving member to be sprayed, a spraying system for spraying in timed relation with said moving member, comprising a spray nozzle disposed in position to direct spraying medium at said moving member, a solenoid actuated valve arranged to control flow of spraying medium to said nozzle, a switch for controlling energization and deenergization of said solenoid actuated valve, movable cam means disposed to control opening and closing of said switch and for movement with respect thereto, and means coupling said cam means to said moving member for synchronizing movement of said cam means and said member in opposite directions.

2. A spraying system for spraying a moving member at selected intervals in timed relation with the moving member, comprising a spray nozzle disposed in position to direct spraying medium at a moving member as it moves past said nozzle, power operated valve means disposed to control spraying medium flow to said nozzle for discharge therefrom, a timing mechanism having a switch therein connected to said valve means to control energization and de-energization of said valve means, a cam mounted in spaced relation to said switch and disposed to controllably open and close said switch in accordance with the contour of said cam upon relative movement of said switch and said cam, and means to couple said cam to said moving member to move said cam in synchronism therewith.

3. In combination with a reciprocating member, a spraying system for spraying said reciprocating member at selected intervals in timed relation with the reciprocating member, comprising a spray nozzle disposed in position to direct spraying medium at said reciprocating member as said member moves past said nozzle, power operated valve means disposed to control spraying medium flow to said nozzle for discharge therefrom, a timing mechanism having a switch therein connected to said valve means to control energization and de-energization of said valve means, a cam mounted in spaced relation to said switch and disposed to controllably open and close said switch in accordance with the contour of said cam upon relative movement of said switch and said cam, means coupling said switch to said cam whereby movement of said cam in only one direction controls operation of said switch, and means coupling said cam to said reciprocating member to move said cam in synchronism with movement of said reciprocating member.

4. A spray system for spraying selected areas of a garment the front and back of which are to be substantially simultaneously pressed and which is to be mounted on a body form buck which is movably mounted with respect to a pair of spaced press heads disposed in a cabinet and movable toward and away from the body form buck when the buck is disposed between the press heads, comprising a cabinet, a spray nozzle mounted on the cabinet and connected to a source of spraying medium, a solenoid actuated valve connected to said nozzle to control the flow thereto from said source of spraying medium, an actuator control mounted on said cabinet

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for controlling energization of the solenoid valve, said actuator control including switching means connected to said solenoid, a cam operator rotatably disposed to controllably operate said switching means and means to couple a body form buck to said cam operator to synchronize its longitudinal movement with the rotational movement of said cam operator.

5. A spraying system for spraying selected areas of a garment to be mounted on a body form buck, said system comprising a cabinet, a pair of press heads disposed in said cabinet, a body form buck on which said garment is to be mounted, said body form buck being mounted for reciprocating movement into and out of a space between said press heads, a spray nozzle mounted on said cabinet and connected to a source of spraying medium, a solenoid actuated valve connected to said nozzle to control the flow of spraying medium to said nozzle from said source, a timing control mounted on said cabinet, switching means in said timing control connected to said solenoid actuated valve to controllably energize and de-energize the same, a rotatable cam mounted in spaced relation to said switching means and arranged with respect thereto so that as said cam rotates it will controllably operate said switching means, a ligature drum mounted for co-rotation with said cam, a ligature connected to said drum and to said body form buck, and means biasing said drum in a direction to wind said ligature on said drum whereby said ligature will be maintained taut and movement of said body form buck will effect rotation of said cam.

6. A spray system for spraying a garment, said system comprising a cabinet, a pair of press heads disposed in said cabinet, a body form buck on which said garment is to be mounted, said body form buck being mounted for reciprocating movement into and out of a space between said pair of press heads, fluid medium spraying means mounted on said cabinet, a solenoid actuator for controlling said fluid medium spraying means, and a timing system for controllably energizing and de-energizing said solenoid actuator, said timing system including a switch connected to said solenoid actuator, a cam follower on said switch, a cam engaging said cam follower for operating said switch, and elongated means coupling said cam to said body form buck to effect movement of said cam in timed relation with movement of said buck.

7. A spray system for controllably spraying a garment, said system comprising an enclosure provided with an access way, a bosom and back press having a pair of press heads disposed in said enclosure and a buck on which said garment is to be mounted, said buck being mounted for movement through said access way into and out of the space between said press heads, a solenoid actuated spray nozzle mounted on said enclosure and arranged to direct spraying medium toward said buck as it enters said enclosure and the space between said press heads, and means controlling energization of said solenoid actuated spray nozzle including cam controlled switching means and means coupling said cam controlled switching means to said buck for energization of said solenoid actuated nozzle only as said buck enters the space between said press heads.

8. A spraying system for spraying in timed relation with a moving member to be sprayed, comprising a spray nozzle disposed in position to direct spraying medium at a moving member, a solenoid actuated valve arranged to control flow of spraying medium to said nozzle, a switch for controlling energization and de-energization of said solenoid actuated valve, movable cam means disposed to control opening and closing of said switch and for movement with respect thereto, and means to couple said cam means to a moving member for synchronizing movement of said cam means therewith, said cam means including a rotatable member, and a plurality of cam-contoured elements adjustably secured to said rotatable member.

9. In combination with a moving member to be sprayed, a spraying system for spraying in timed relation with said

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moving member, comprising a spray nozzle disposed in position to direct spraying medium at said moving member, a solenoid actuated valve arranged to control flow of spraying medium to said nozzle, a switch for controlling energization and de-energization of said solenoid actuated valve, movable cam means disposed to control opening and closing of said switch and for movement with respect thereto, and means coupling said cam means to said moving member for synchronizing movement of said cam means and said member, said cam means including a rotatable member, and a plurality of substantially pie slice-shaped, cam-contoured elements adjustably secured substantially coaxially on said rotatable member.

10. In combination with a moving member to be sprayed, a spraying system for spraying in timed relation with said moving member, comprising a spray nozzle disposed in position to direct spraying medium at said moving member, a solenoid actuated valve arranged to control flow of spraying medium to said nozzle, a switch for controlling energization and de-energization of said solenoid actuated valve, movable cam means disposed to control opening and closing of said switch and for movement with respect thereto, and means coupling said cam means to said moving member for synchronizing movement of said cam means and said member, said cam means including a rotatable member, and a plurality

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of cam-contoured elements adjustably secured on said rotatable member at the periphery thereof.

11. In combination with a moving member to be sprayed, a spraying system for spraying in timed relation with said moving member, comprising a spray nozzle disposed in position to direct spraying medium at said moving member, a solenoid actuated valve arranged to control flow of spraying medium to said nozzle, a switch for controlling energization and de-energization of said solenoid actuated valve, movable cam means disposed to control opening and closing of said switch and for movement with respect thereto, and means coupling said cam means to said moving member for synchronizing movement of said cam means and said member, said cam means including a rotatable member, a plurality of cam-contoured elements adjustably secured on said rotatable member at the periphery thereof, and a cam-contoured element radially adjustably secured to said rotatable member.

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