Jan. 1, 1963 S. M. FORSHEE 3,071,060

COLLAPSIBLE SHAFT FOR DISPOSABLE PAINT SPRAY CURTAIN

Filed June 21, 1961 2 Sheets-Sheet 1

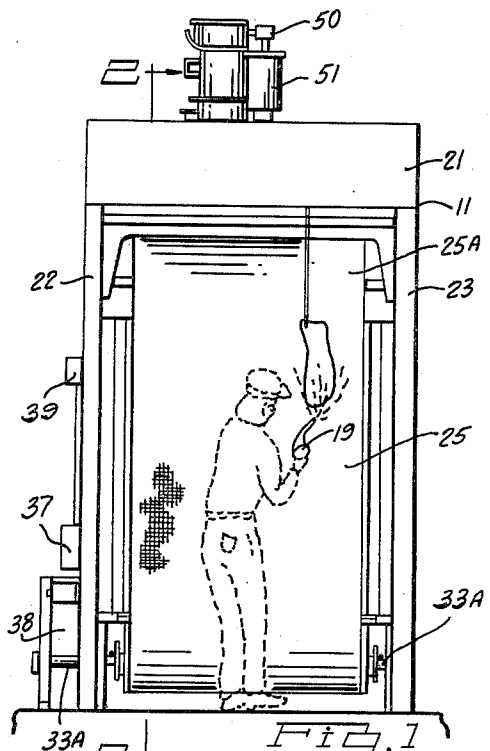


Fig. 1

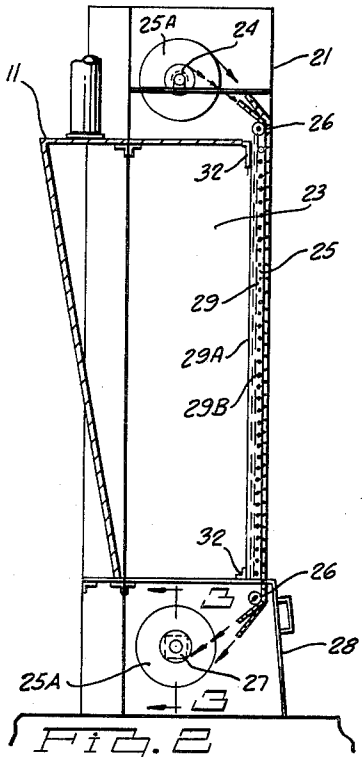


Fig. 2

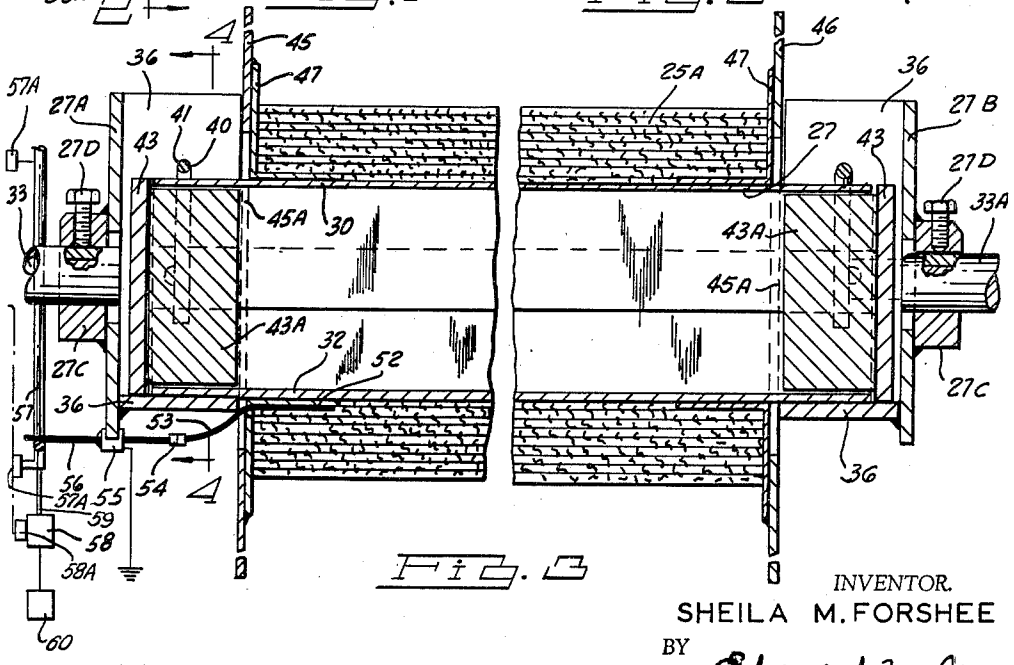


Fig. 3

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COLLAPSIBLE SHAFT FOR DISPOSABLE PAINT SPRAY CURTAIN

Filed June 21, 1961 2 Sheets-Sheet 2

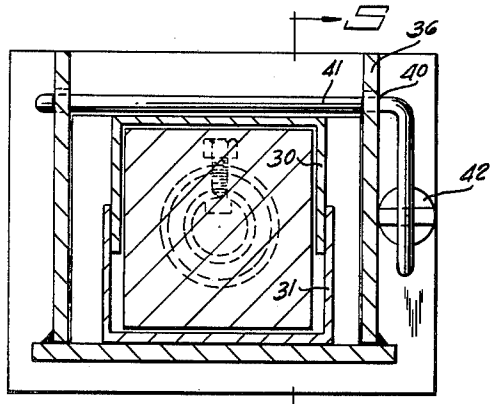


Fig. 4

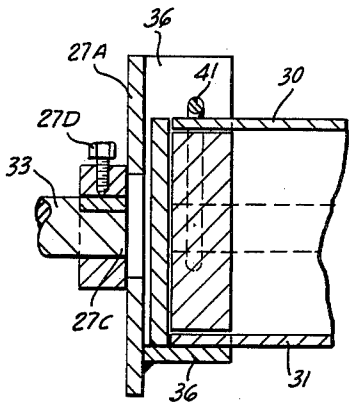


Fig. 5

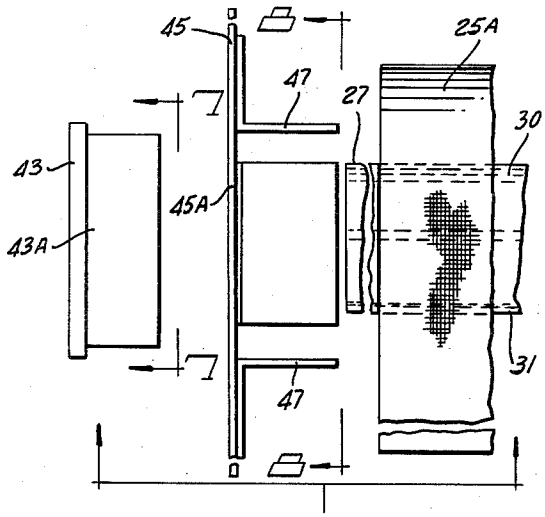


Fig. 6

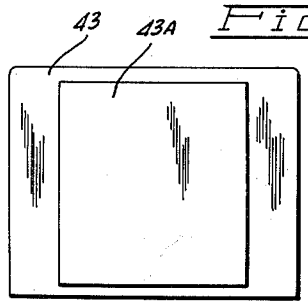


Fig. 7

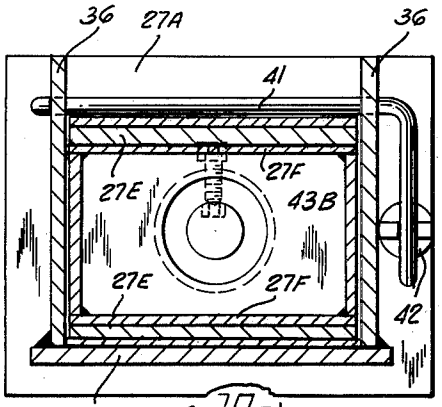


Fig. 10

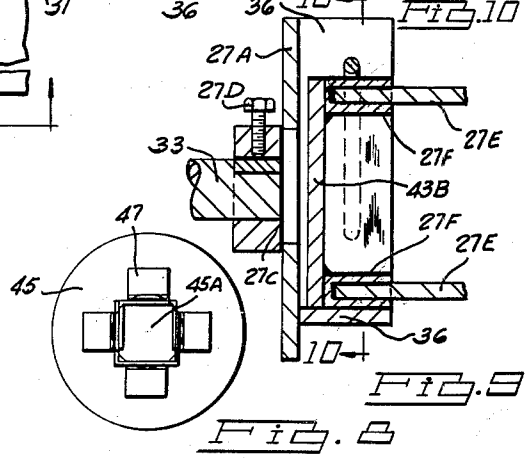


Fig. 9

Fig. 8

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COLLAPSIBLE SHAFT FOR DISPOSABLE PAINT SPRAY CURTAIN

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Filed June 21, 1961, Ser. No. 118,611
9 Claims. (Cl. 98—115)

This invention relates to the art of paint spraying and has particular reference to an improved shaft for collecting a disposable paint spray curtain, such as disclosed in United States Letters Patent No. 2,841,073, issued to me on July 1, 1958, and United States Letters Patent No. 2,875,680, issued to me on March 3, 1959.

An object of this invention is to generally improve paint spray booth equipment and to provide a device which enhances the method, or process, disclosed in the said patents previously issued to me.

Another object of this invention is to provide a collapsible device for collecting and disposing of spray curtain material after it has been used in my process of trapping paint over spray.

A further object of the invention is to provide a spray curtain collector, which is simple in construction, economical to manufacture, easy to assemble and disassemble.

A further object of this invention is to provide a device of the character indicated, which greatly facilitates the collection and disposal of wet, heavily laden sections of material used as a back drop or curtain in a paint spray booth, or the like.

A further object of the invention is to provide a collapsible shaft for collecting paint spray curtain material, with thermostatic means positioned adjacent the collected material and means connected to said thermostatic means for indicating the temperature of the material collected, whereby to prevent the possibility of spontaneous combustion in the material.

Another object of the invention is to construct a collapsible shaft of the character indicated, which is formed of a pair of spaced flat bars with end means for supporting the bars, whereby the disposable curtain material may easily be started for rolling on the shaft.

The foregoing and other objects and advantages of the invention will become more apparent as the description proceeds, reference being made from time to time to the accompanying drawings forming part of the within disclosure, in which drawings:

FIG. 1 is a front elevational view of a paint spray booth embodying the invention with the lower roll cover removed.

FIG. 2 is a vertical section taken substantially on the line 2—2 of FIG. 1, but with the lower roll cover in place.

FIG. 3 is an enlarged section, with parts broken away, taken substantially on the line 3—3 of FIG. 2.

FIG. 4 is a vertical section taken substantially on the line 4—4 of FIG. 3.

FIG. 5 is a section taken substantially on the line 5—5 of FIG. 4.

FIG. 6 is an enlarged and exploded view showing one of the end blocks, a guide plate, an end portion of the shaft and a portion of the roll of used material, after the shaft has been removed from the machine and collapsed.

FIG. 7 is a view taken substantially on the line 7—7 of FIG. 6, and shows, in elevation, one of the end blocks.

FIG. 8 is a section taken substantially on the line 8—8 of FIG. 6 and shows, in elevation, one of the guide plates.

FIG. 9 is a vertical section similar to that shown in FIG. 5, but illustrating a different form of end closure member and a different form of collapsible shaft construction.

FIG. 10 is a section taken substantially on the line 10—10 of FIG. 9.

Referring now more particularly to the drawings, it will be understood that in the embodiment herein disclosed, the reference character 11 indicates, in general, the paint spray booth which is preferably made of sheet metal material fabricated, as more particularly disclosed and claimed in my issued patents hereinabove referred to. The paint spray booth has a top 21, and side walls 22 and 23 which serve as a housing for, and means to support the upper roll 24 (FIG. 2) on which is stored the material 25A from which the fabric curtain 25 is formed. The material 25A extends downwardly from the roll 24 to form the front wall 25 of the spray booth. The material 25A extends downwardly from the roll 24 over idler rolls 26 (FIG. 2) and onto the collector shaft 27 (FIG. 2) which is constructed and driven as hereinafter described.

The booth is provided with an upper removable panel (not shown) and a lower panel 28 (FIG. 2) so that access may be had to the upper and lower rolls of material 25A for loading, unloading and replacing the material 25A. The curtain wall 25 is preferably backed-up with a backing member 29 (FIG. 2) which is preferably made of a plurality of vertical members 29A, and a plurality of horizontal members 29B which are secured together in a grid-like manner by welding or other suitable means, which backing member 29 is supported in a channel-like frame 32 supported on the inside walls of the device. This member is intended to reinforce and support the material of the curtain 25, so that the curtain 25 may withstand the blast from the spray gun 19 and the air which passes through the curtain 25, and so that the curtain 25 may resist the pressure of any object which may be forced against it during the spraying operation.

The material 25A comprising the wall 25 is preferably a non-woven fabric, and is preferably made of fibers adhesively bonded to one another with heat, pressure and/or vacuum subjected to various forms of application to insure uniform dispersion of the bonding agents. The bonding is done by chemothermic process under extremely high heat, pressure and/or vacuum. The non-woven fabric used in this disclosure is preferably a blend of cotton fibers, which will give maximum absorbency, and which will add a maximum degree of bonding strength, and provide a maximum degree of tensile strength, so that the material comprising the curtain may be pulled from one roll to the other.

The fibers of the material are preferably calendered or pressed to a layer of thickness of approximately 1/64 of an inch to provide a normally dry, smooth surface, without nap. The fabric material is preferably flame proofed with any suitable chemical composition. The material so described offers little, if any, resistance to the passage of air there through, and because of its high factor of absorbency will catch, hold and absorb any and all paint spray which may contact it during the paint spray operation. This material, when loaded with excess paint spray, is readily disposable. The used sections of the material 25A are continuously rolled onto the collector roll 27 which, when filled, is readily removed and disposed of as hereinafter described.

The collapsible shaft 27 is carried on stub shafts 33 and 33A which are supported in suitable bearings (not shown) secured to the walls 22 and 23 of the booth. The collapsible shaft or collector roll 27 is supported at either end, by a pair of end plates 27A and 27B, to the inner faces of which are welded the U-shaped carrier members 36 (FIG. 3). To the opposite faces of the plates 27A and 27B are welded bosses 27C which are secured to the shafts 33 and 33A by set screws 27D, so that the plates 27A and 27B rotate with the shafts 33 and 33A. The shaft 33 is

driven by a suitable motor 37 through a gear train enclosed in a housing 38, and is controlled by a switch 39 mounted on the outside of the booth. The U-shaped carrier members 36 are arranged to receive the ends of a pair of channel shaped members 30 and 31, the edges of which telescope each other, as shown in FIG. 4. The vertical legs of the U-shaped carrier members 36 (FIGS. 3 and 4) are bored, as at 40, to receive locking pins 41 which extend there through and prevent the channel members 30 and 31 from being displaced through the open end of the U-shaped member 36, while the collapsible shaft, or roll 27, is in rotation. The locking pin 41 is preferably held in position by means of a magnet 42. In order to prevent the channel members 30 and 31 from telescoping each other too far, I provide, at each end, an end closure block 43 which has a substantially square reduced portion 43A, which extends into the channel shaped members 30 and 31 (FIG. 3) and holds them against their fully telescoping each other, but which, when removed, as shown in FIG. 6, permits the channel shaped members 30 and 31 to telescope one another to collapse the shaft 27, so that the shaft 27 may be removed from the used portion of the material 25A, as shown in FIG. 6.

In order to retain the paint laden material 25A (FIG. 3) on the collapsible shaft, or roll 27, I provide a pair of guide plates 45 and 46 (FIGS. 3, 6 and 8), each of which has welded to its inner face a plurality of L-shaped brackets 47, the horizontal legs of which rests upon the channel members 30 and 31 and help to hold them in position during the rotation of the collapsible shaft 27. The guide plates 45 and 46 are provided with substantially square cutout portions 45A, so that the ends of the channel members 30 and 31 may be extended there through.

In FIGS. 9 and 10, I show a modified form of the collapsible shaft 27, in which the longitudinal members of the shaft 27 consists of a pair of bars 27E. The ends of the bars 27E are received in channel members 27F, which are welded to the inner face of the end plate 43B which is substantially square and is arranged to be received in the U-shaped carrier members 36, which are welded to the carrier plates 27A and 27B, as previously described. The end plates 43B carrying the channel members 27F, may be removed from the bars 27E to collapse the collector roll 27 in the same manner as the channel members 30 and 31 (FIG. 6) are collapsed, when the end blocks 43 are removed.

It will be understood that the collapsible shaft, or roll 27, is driven by means of the shaft 33 through the member 27C and the plate 27A. The end blocks 43 and 43A are received in the U-shaped carrier members 36 and rotate therewith. The ends of the channel members 30 and 31 are supported by the reduced portions 43A of the end blocks 43 and rotate therewith.

After a predetermined amount of paint laden material 25A is received on the collapsible roll 27 and it is desired to remove the paint saturated sections of material, the pins 41 are first removed from the U-shaped carrier members 36 and the roll 27, with the paint laden material 25A, is lifted bodily out of the U-shaped carriers 36. When so removed, the end blocks 43 (FIG. 6) of the modified end blocks 43B (FIGS. 9 and 10) are removed from the ends of the channel members 30 and 31, or in the modified form, which bars 27E permit the channel members 30 and 31, or the bars 27E to collapse, as shown in FIG. 6. The collapsible roll 27 may then be removed from the paint laden material 25A.

The excess air and fumes from the paint spray operation are withdrawn through the top of the booth by means of a conventional blower 50 which is driven by a motor 51, as in conventional practice.

In order to overcome the danger of spontaneous combustion in the paint laden material 25A on the shaft 27 (FIG. 3), I provide a heat conducting element 52 which is preferably positioned between the channel member and the material 25A, which conductive element is connected through a suitable lead 53 and a coupling 54, to a thermo switch 55 which is grounded on one side and connected on the other side to a finger 56 which contacts a ring 57 carried on and insulated from the side of the booth, in any manner as at 57A. The ring 57 is electrically connected to a signal device 58, as at 59 which device is supported on the booth, as at 58A, and is connected to a power source as at 60, so that any excessive heat in the used material 25A will close the switch 55 and close the circuit through the ring 57 and the signal device 58, to indicate to the operator that the material 25A should be removed from the collapsible shaft.

It is believed that the operation of the device is obvious from the foregoing description.

Having described my invention, what I claim and desire to secure by Letters Patent is:

1. A collapsible shaft for collecting a disposable spray booth curtain, comprising a pair of longitudinal members, means to maintain said members in parallel relation, means to support the ends of said members, and means to rotate said members about the longitudinal axis of the shaft, said longitudinal members being channel shaped in cross section, there being end blocks, having portions extending into said channels, for holding said channel members parallel.

2. A collapsible shaft for collecting a disposable spray booth curtain, comprising a pair of longitudinal members, means to maintain said members in parallel relation, means to support the ends of said members, and means to rotate said members about the longitudinal axis of the shaft, said longitudinal members being flat bars, end blocks for supporting said bars, said blocks having channel means thereon for receiving the ends of said bars and holding the said bars in normally spaced relation.

3. A collapsible shaft for collecting a disposable spray booth curtain, comprising a pair of longitudinal members, means to maintain said members in parallel relation, means to support the ends of said members, and means to rotate said members about the longitudinal axis of the shaft, said means for maintaining said members in parallel relation comprising end blocks, and said means for supporting and rotating said members, comprising a pair of shafts, one of which is power driven, a plate secured for rotation with each said shaft, each said plate having a U-shaped carrier member on its inner face, each said U-shaped carrier member having received therein, one of said end blocks.

4. A collapsible shaft for collecting a disposable spray booth curtain, comprising a pair of longitudinal members, means to maintain said members in parallel relation, means to support the ends of said members, and means to rotate said members about the longitudinal axis of the shaft, said means for maintaining said members in parallel relations comprising end blocks, and means for supporting and rotating said members, including a pair of shafts, one of which is power driven, a plate secured for rotation with each said shaft, each said plate having a U-shaped carrier member on its inner face, each said U-shaped carrier member having received therein, one of said end blocks, and means for holding said end blocks in said U-shaped carrier members, during the rotation of said longitudinal members.

5. A device of the character described for use with a spray booth having side walls and a disposable front curtain, comprising a pair of shafts, one of which is power driven, a plate secured for rotation with each shaft, each plate having a U-shaped carrier member secured to its inner face, end blocks received in said U-shaped carrier members, and a pair of longitudinal members supported in parallel relation by said end blocks, said longitudinal members being adapted to receive, when in rotation, used portions of the said front curtain material.

6. A collapsible shaft for collecting a disposable spray

booth curtain, comprising a pair of longitudinal members, means to maintain said members in parallel relation, means to support the ends of said members, and means to rotate said members about the longitudinal axis of the shaft, including means associated with said longitudinal members and used portions of said curtain, for indicating an excessive temperature in the used portions of said curtain.

7. A collapsible shaft for collecting a disposable spray booth curtain, comprising a pair of longitudinal members, means to maintain said members in parallel relation, means to support the ends of said members, and means to rotate said members about the longitudinal axis of the shaft, including a pair of guide plates, each plate having an opening for receiving the ends of said first named members, and each of said plates having L-shaped members thereon for preventing the radial movement of said first named members when being rotated.

8. A device of the character described for use with a spray booth having side walls and a disposable front curtain, comprising a pair of shafts, one of which is power driven, a plate secured for rotation with each shaft, each plate having a U-shaped carrier member secured to its inner face, end blocks received in said U-shaped carrier members, and a pair of longitudinal members supported in parallel relation by said end blocks, said longitudinal members being adapted to receive, when in rotation, used portions of the said front curtain material, and a heat

conductive element adjacent one of said longitudinal members, a thermo active switch connected to said heat conductive element, and an electric circuit connected to a signal device and to said switch.

9. A device of the character described for use with a spray booth having side walls and a disposable front curtain, comprising a pair of shafts, one of which is power driven, a plate secured for rotation with each shaft, each plate having a U-shaped carrier member secured to its inner face, end blocks received in said U-shaped carrier members, and a pair of longitudinal members supported in parallel relation by said end blocks, said longitudinal members being adapted to receive, when in rotation, used portions of the said front curtain material, and a heat conductive element adjacent one of said longitudinal members, a thermo active switch connected to said heat conductive element, and an electric circuit connected to a signal device and to said switch, said circuit including a conductor rotatable with one of said first named plates and a conductive slip ring carried by one of said side walls.

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