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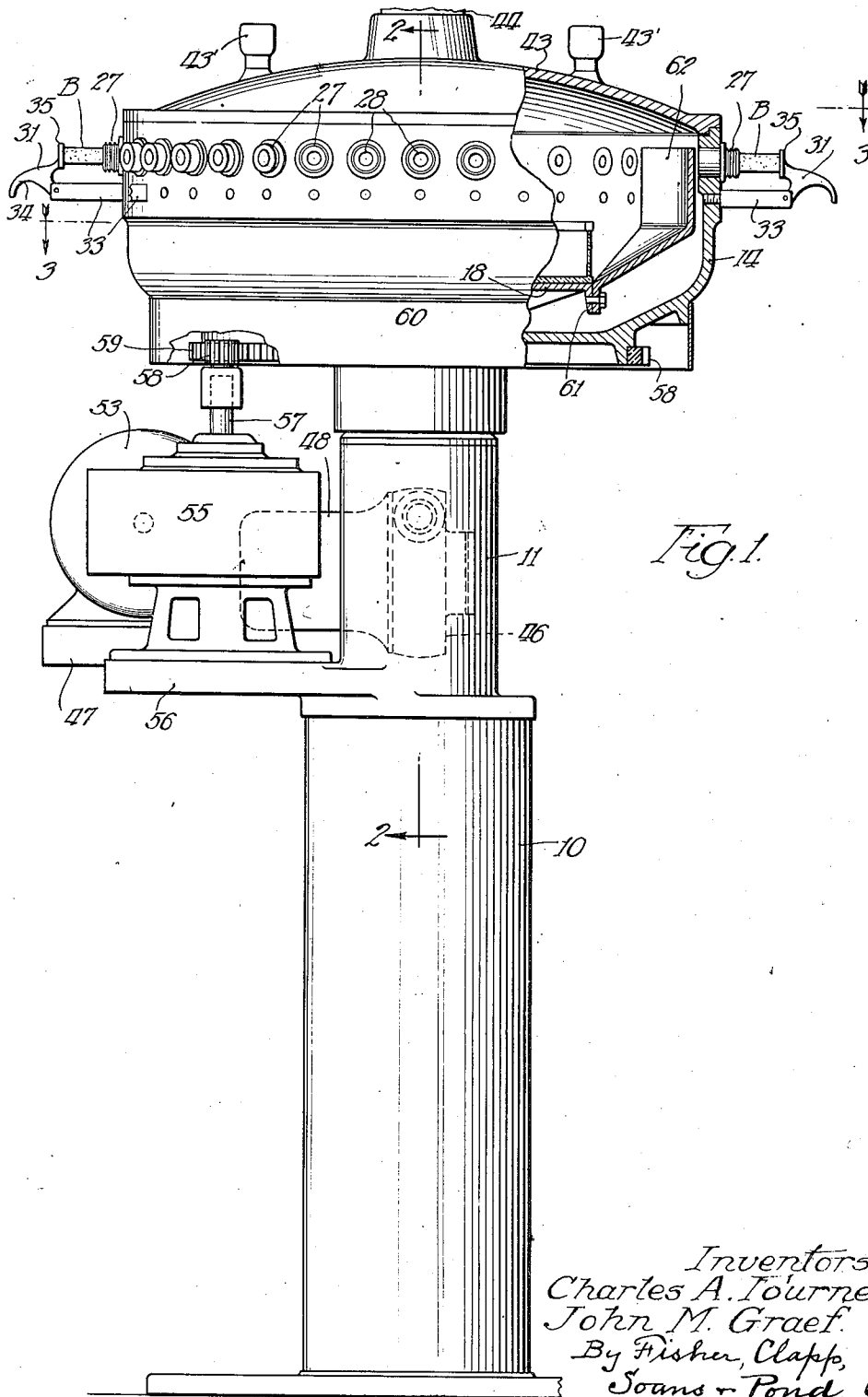
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2,077,231

MACHINE FOR POINTING AND DRYING TAMPONS

Filed Oct. 16, 1935

3 Sheets-Sheet 1



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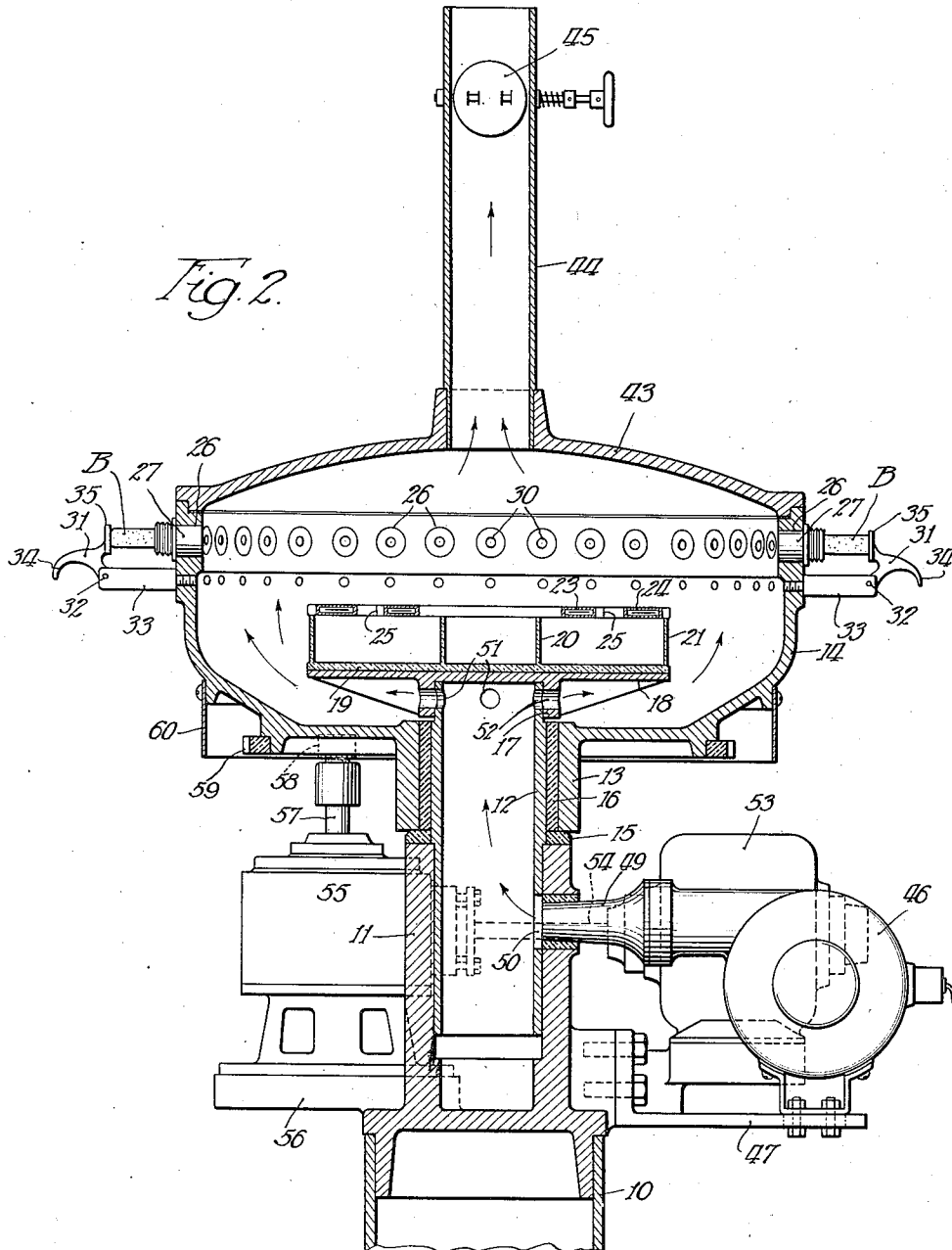
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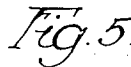
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3 Sheets--Sheet 3



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UNITED STATES PATENT OFFICE

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MACHINE FOR POINTING AND DRYING
TAMPONS

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Application October 16, 1935, Serial No. 45,365

9 Claims. (Cl. 18—21)

This invention relates to a machine for completing the final operation in the manufacture of tampons from creped absorbent wadding or like material. In a method of manufacturing such tampons which we have designed and successfully put in practice, a sheet of sixteen-ply creped absorbent wadding is first repeatedly folded or crimped on itself into a substantially round or cylindrical form, and then run through a wide mesh braiding machine which compacts and holds together the numerous folds and produces a substantially round uniform article of about five-eighths inch diameter known as the tampon "cord". This cord is then run through a cord coating machine which first applies a concentrated starch solution to the surface of the cord, then wraps a thin sheet or strip of cotton wadding on this cord, then applies a diluted starch solution as an impregnation and thin second coating to the covering sheet or strip, and finally compacts and reduces the cord and winds it on a polygonal reel. The reel with the cord thereon is then placed in a drying oven in which it is subjected to a flow of heated air sufficiently long to thoroughly dry the cord. The cord is then cut in tampon lengths, and, by means of a stitching machine, the closed end of a cord loop is drawn through and then looped around the tampon about one-half inch from the outer or rear end thereof and the two free ends of the loop are knotted together. Finally, the inner or forward end of the tampon is moistened to render it pliable and then compressed in a die and dried to give it a comparatively rigid blunt pointed conical end form.

Our present invention relates to a machine for performing the last-named operation, that is, the shaping and drying of the inner or forward end of the tampon, and a practical form of such machine is illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation of the machine, partly broken away and in vertical section.

Fig. 2 is an axial vertical section taken on the line 2—2 of Fig. 1.

Fig. 3 is a top plan view, partly broken away and in horizontal section on the offset line 3—3 of Fig. 1.

Fig. 4 is an enlarged detail view in vertical section of one of the shaping dies and the device for pressing the tampon blank endwise therein.

Fig. 5 is a perspective view of the tampon blank before it is inserted in the die.

Fig. 6 is a perspective view of the finished tampon.

In the drawings, 10 designates a hollow pedestal on which the operating parts of the machine are mounted and supported. Tightly fitted in the upper end of the pedestal 10 is an upright hollow casting 11, and within the latter is tightly fitted the lower portion of a sleeve 12, the upper portion of which serves as a bearing for the hub 13 of a rotatable shell 14. The hub 13 is stepped on a bearing ring 15 and revolves on a bushing 16 that encircles the upper portion of the sleeve 12. The ring 15 and bushing 16 are preferably made of a fibrous material quite extensively used for bearings and known as Micarta. Tightly fitted on the upper end of the sleeve 12 within the shell 14 is the depending hub 17 of a round table 18 that, in turn, forms a support for a spider consisting of a base plate 19, inner and outer concentric rings 20 and 21, and radial spokes 22 (Fig. 3) between the inner and outer rings. On the top edges of the spokes 22 are seated a pair of inner and outer electric heating rings 23 and 24 of a known make, the rings being positioned by suitably located upstanding pins 25 on the top edges of the spokes.

The upper edge portion of the shell 14 is formed with a ring of holes 26, in each of which is tightly fitted a die member 27. This die member 27, as best shown in the enlarged view Fig. 4, is formed with an axial cavity, the major portion 28 of which is cylindrical and of a diameter to receive the tampon blank B (Fig. 5). This cylindrical portion merges into an inwardly tapered portion 29, and beyond the latter is a reduced cylindrical portion 30 extending to the inner face of the die. Associated with each of these dies is a device for lightly pressing the tampon blank inwardly into the die. A simple and convenient device for this purpose consists of a trigger 31 that is pivoted at 32 on and between the arms of a forked bracket 33 that is screwed into the wall of the shell 14 just below the die 27. The trigger 31 is formed with a finger piece or handle 34 and on its upper end with a flat tampon-engaging nose 35. In the lower forked end of the trigger 31 is pivoted a roller 36 that co-operates with the head 37 of a spring pressed pusher, the tubular stem or shank 38 of which is slidably mounted on a fixed stud 39 secured in the base of the bracket 33, a cross pin 40 in the stem 38 extending through a slot 41 in the stud 39 constituting a movement-limiting device for the pusher under the thrust of a coil compression spring 42 that encircles the stem 38. The pivotal axis of the roller 36 is so related to the pivot 32 of the trigger that it creates a past center movement whereby the trigger is yieldably held by the

pusher in its working position and drops by gravity and the thrust of the pusher to idle position as shown by full and dotted lines respectively in Fig. 4.

5 The shell 14 is closed at the top by a cover 43, in the center of which is mounted a vertical flue 44 equipped with a draft-regulating damper 45. The cover is equipped with a pair of handles 43' for convenience in applying and removing the same.

10 Means are provided for creating a flow of air through the chamber formed by the shell 14 and its cover 43. As herein shown, this means comprises a blower 46 mounted on a bracket 47 that is attached to one side of the hollow casting 11, the blower 46 being driven by an electric motor 48. The outer end of the discharge pipe 49 of the blower is fitted to a hole in the wall of the casting 11 in register with a hole 50 in the wall of the sleeve 12, so that the air discharged by the blower passes upwardly through the sleeve 12 and thence through registering holes 51 and 52 in the members 12 and 17 into the chamber of the shell 14. This air is heated within the chamber by the heating rings 23 and 24 and flows upwardly out of the chamber through the flue 44 at a speed regulated by the position of the damper 45.

The shell 14 is given a slow rotation, about one revolution per minute, by a simple drive mechanism comprising an electric motor 53 mounted on the bracket 47, the shaft 54 of which, through a speed reducer 55 mounted on a bracket 56 drives a vertical shaft 57 equipped on its upper end with pinion 58 meshing with and driving a large spur gear 59, preferably of Micarta, on the lower end of the shell 14, the gear ring 59 being surrounded by a guard 60.

Attached to a segmental flange 61 depending from the table 18 (Fig. 1) is a stationary segmental guard 62 that lies directly in front of the operator's seat, the purpose of which is to prevent any substantial escape of the heated air through the dies as a fully pointed and dried tampon is withdrawn and a fresh blank inserted in each die.

45 It will be observed that the outer projecting end portions of the dies 27 are threaded. These threads form, in effect, cooling rings or fins which reduce the heat at the outer ends of the dies and prevent the tampons from being scorched. The inner end portions of the dies, into which the moistened ends of the tampons are pressed, have a larger area of metal; hence more heat can be stored where it is most needed.

To prepare the machine for operation it is necessary to have the dies thoroughly heated, and by closing the damper 45 the heat is turned on and, with the blower started up, the heat is forced through the die openings, and within a few minutes the machine is ready for operation. Within easy reach of the operator at the loading and unloading station, a piece of wadding soaked with distilled water serves as a means to moisten the tip of the tampon by pressing the same lightly against the wadding. The motor 53 having been started up, the shell rotates slowly, about one revolution per minute and the operator successively moistens and inserts the tampon blanks into the several dies until they are all loaded. At the completion of the first rotation of the die carrier, the operator successively withdraws the shaped and dried tampons and inserts new blanks, so that the operation of loading and unloading the machine is continuous. In withdrawing each tampon the operator merely depresses the trigger

31, withdraws the tampon and inserts a fresh blank, and then raises the trigger; the entire operation requiring only from one to two seconds at the hands of an expert operator.

We have herein shown and described one specific embodiment of a machine that has been found in practice to successfully point and dry the tampon blanks, but manifestly the structural details may be varied within the scope of the invention as defined in the appended claims.

We claim:

1. In a machine for pointing tampons, the combination of a circular die carrier pivoted to turn on a vertical axis, a ring of closely spaced dies mounted horizontally in the circumference of said die carrier, each of said dies having a cavity of circular cross section with a tapered narrowed inner end portion shaped to form a blunt conical end on a tampon blank, a pivoted spring-actuated trigger having a past center movement for pressing the blank endwise into the die, and means for effecting a slow continuous rotation of said carrier past a loading and unloading station.

2. In a machine for pointing and drying tampons, the combination of a hollow rotary die carrier, a group of dies mounted in the circumferential wall of said carrier, each of said dies having a cavity communicating with the chamber of said carrier and shaped to form a blunt conical end on a tampon blank, means associated with each die for pressing a moistened blank into the die, means for forcing air through said chamber, and means for heating said air.

3. In a machine for pointing and drying tampons, the combination of a hollow rotary die carrier, a group of dies mounted in the circumferential wall of said carrier, each of said dies having a cavity communicating with the chamber of said carrier and shaped to form a blunt conical end on a tampon blank, means associated with each die for pressing a moistened blank into the die, means for forcing air through said chamber, and means in said chamber for heating the air entering the same.

4. In a machine for pointing and drying tampons, the combination of a hollow rotatable die carrier, a ring of dies mounted in the circumferential wall of said carrier, said dies having tampon-pointing cavities extending therethrough and open at their inner ends to the chamber of said carrier, means associated with each die for pressing a tampon blank therein, means for flooding said chamber with heated air, means for rotating said carrier past a loading and unloading station, and means operative to check escape of air through said dies during the loading and unloading operations.

5. In a machine for pointing and drying tampons, the combination of a hollow rotatable die carrier, a ring of dies mounted in the circumferential wall of said carrier, said dies having tampon-pointing cavities extending therethrough and open at their inner ends to the chamber of said carrier, means associated with each die for pressing a tampon blank therein, means for flooding said chamber with heated air, means for rotating said carrier past a loading and unloading station, and a stationary guard plate in said chamber serving to substantially close the inner ends of said dies against escape of air there-through as they pass the loading and unloading station.

6. In a machine for pointing and drying tampons, the combination of a hollow rotary die

carrier, a group of tampon-pointing dies mounted in the circumferential wall of said carrier, means associated with each die for pressing a tampon blank therein, means for flooding the chamber of said carrier with heated air, and means for regulating the outflow of heated air from said chamber.

7. In a machine for pointing and drying tampons, the combination of a hollow rotary die carrier, a group of tampon-pointing dies mounted in the circumferential wall of said carrier, means associated with each die for pressing a tampon blank therein, means for flooding the chamber of said carrier with heated air, a discharge flue for heated air communicating with said chamber, and a damper in said flue.

8. In a machine for pointing and drying tampons, the combination of a hollow die carrier mounted to rotate on a vertical axis, a ring of tampon-pointing dies mounted in the circumferential wall of said carrier, means associated with each die for pressing a tampon blank therein,

an air inflow pipe communicating with the chamber of said carrier through the bottom wall thereof, a blower communicating with said inflow pipe, an air heating element in said chamber, a discharge pipe for heated air communicating with said chamber through the top wall thereof, and a damper in said discharge pipe.

9. In a machine for pointing tampons, the combination of a circular die carrier pivoted to turn on a vertical axis and having a ring of horizontal closely spaced holes in its circumferential wall, stationary removable dies tightly fitting said holes, each of said dies having an axial cylindrical cavity with a tapered narrowed inner end portion shaped to form a blunt conical end on a tampon blank, manually controlled spring-actuated means associated with each die for pressing the blank endwise into the die, and means for effecting a slow rotation of said carrier past a loading and unloading station.

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