May 2, 1967 G. N. STRIKE 3,316,658

TWO-SIDED TUMBLER

Filed April 5, 1965 4 Sheets-Sheet 1

Fig. 1.

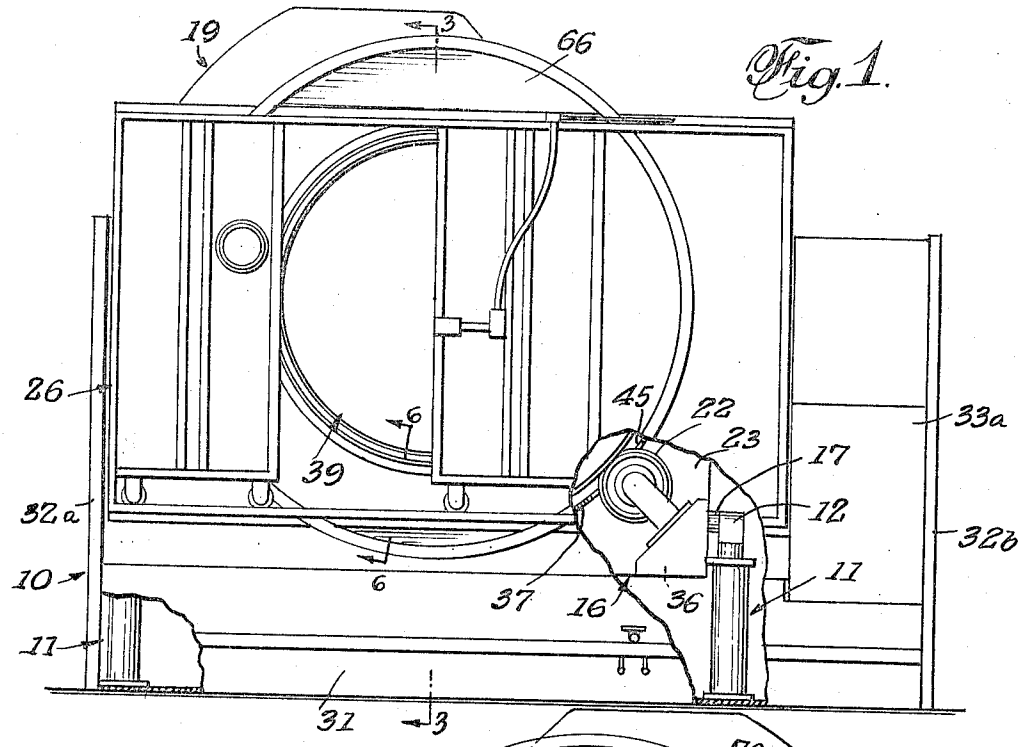
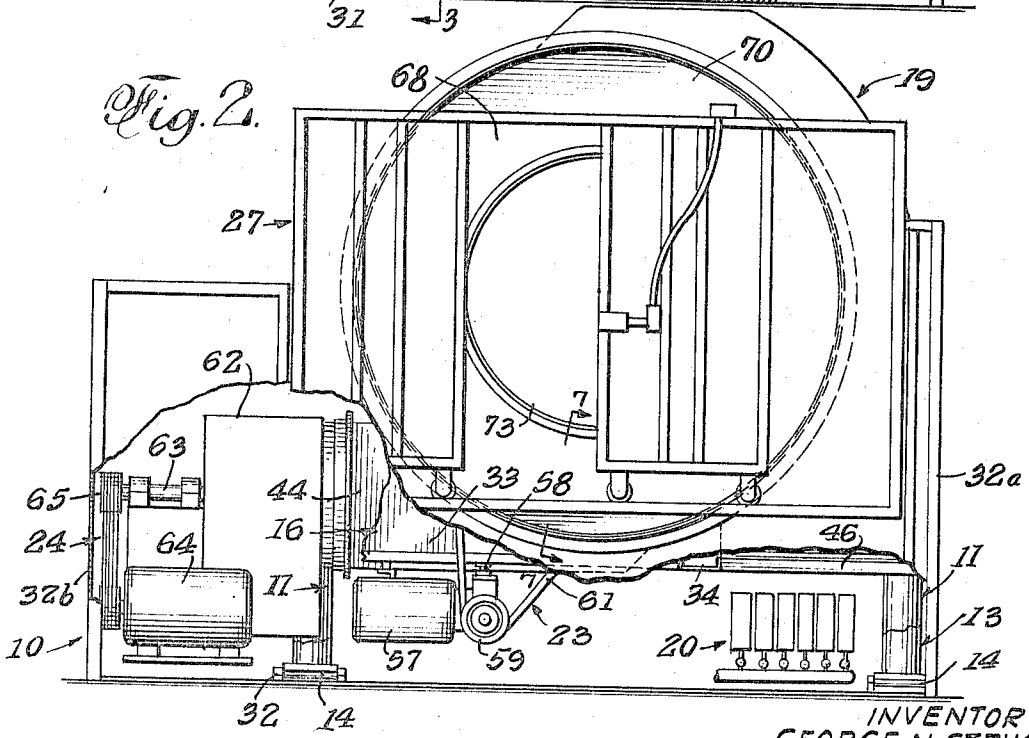


Fig. 2.



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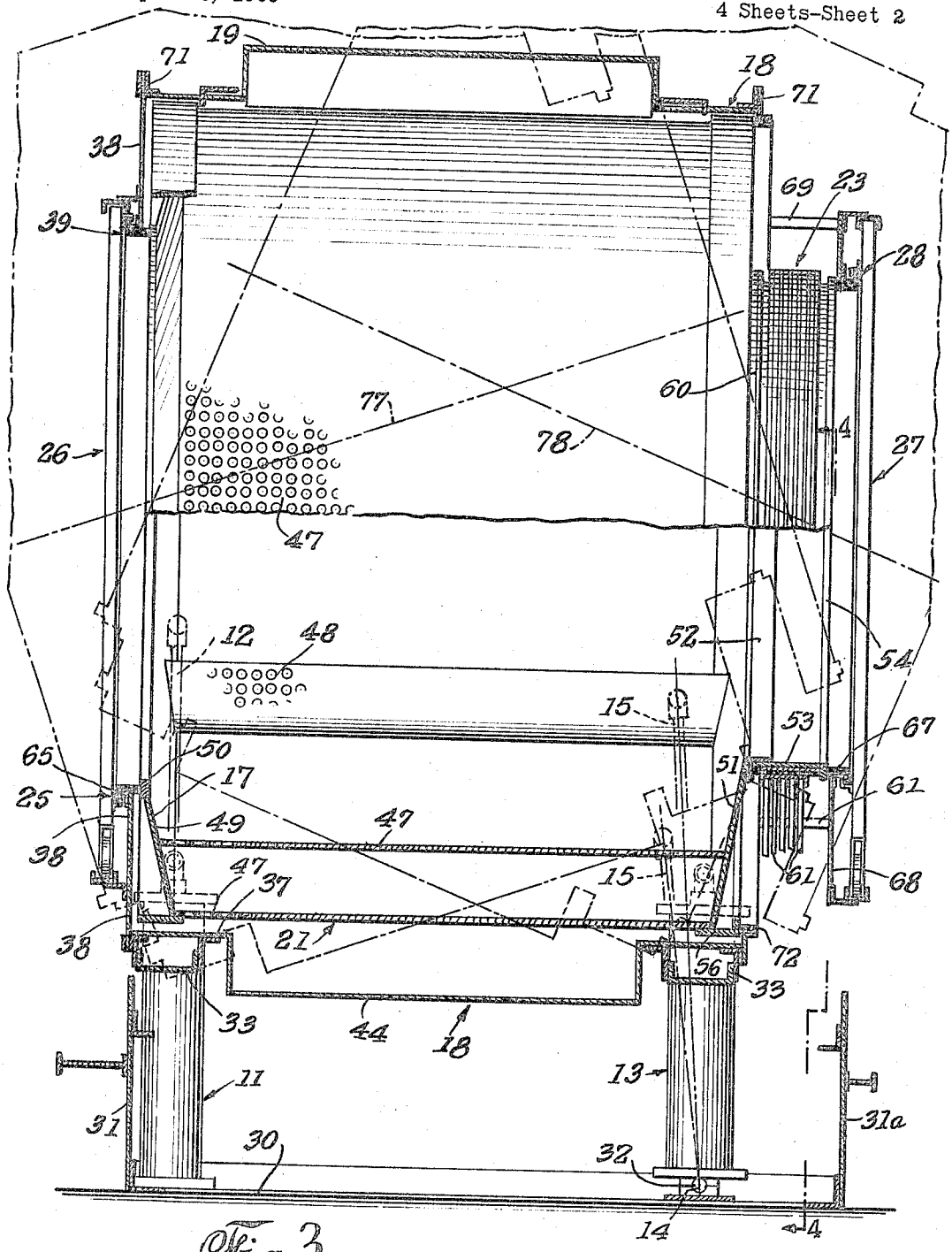


Fig. 3.

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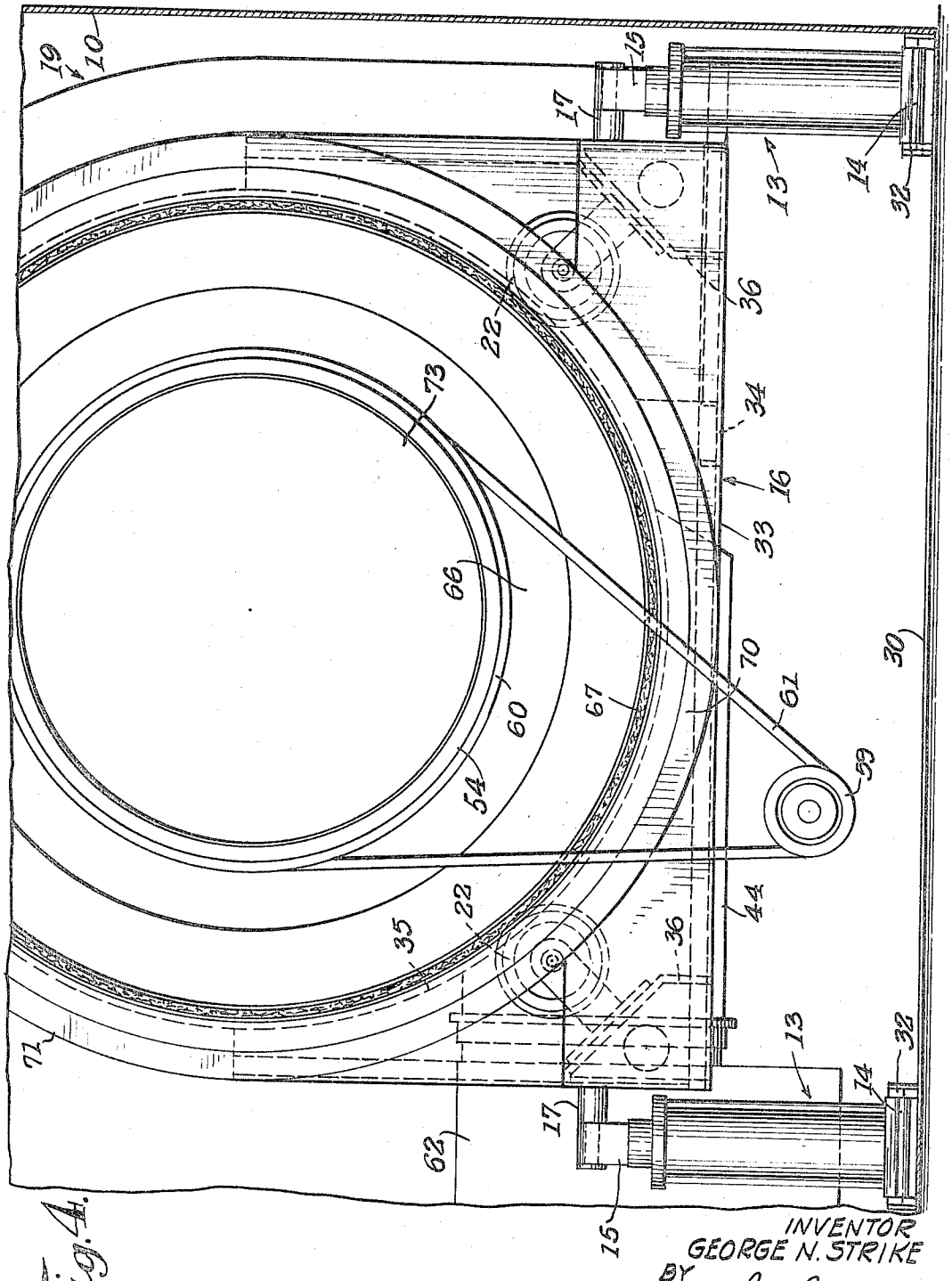


Fig. 4.

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Fig. 6

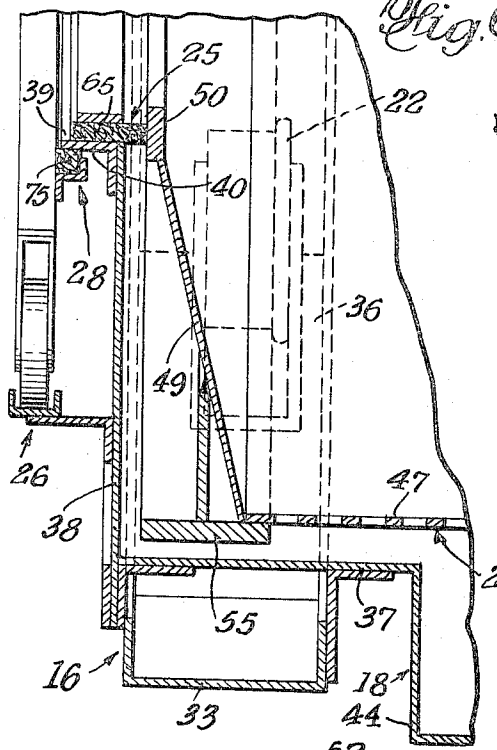
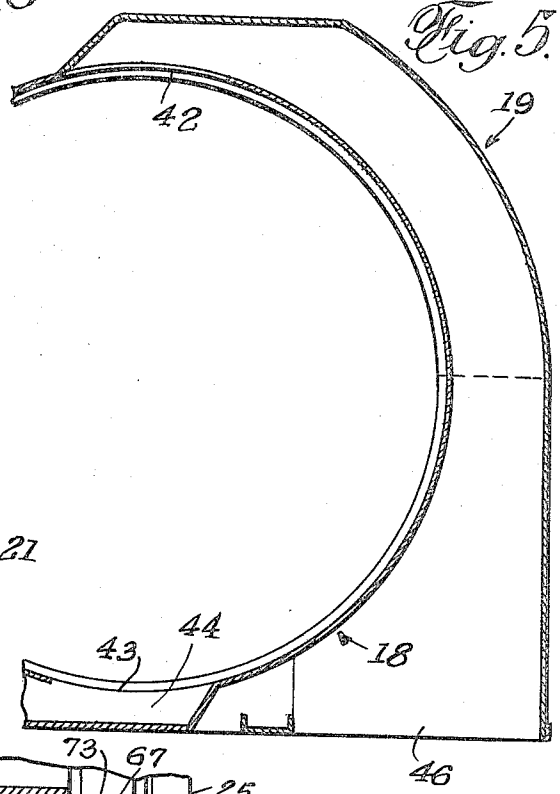


Fig. 5.



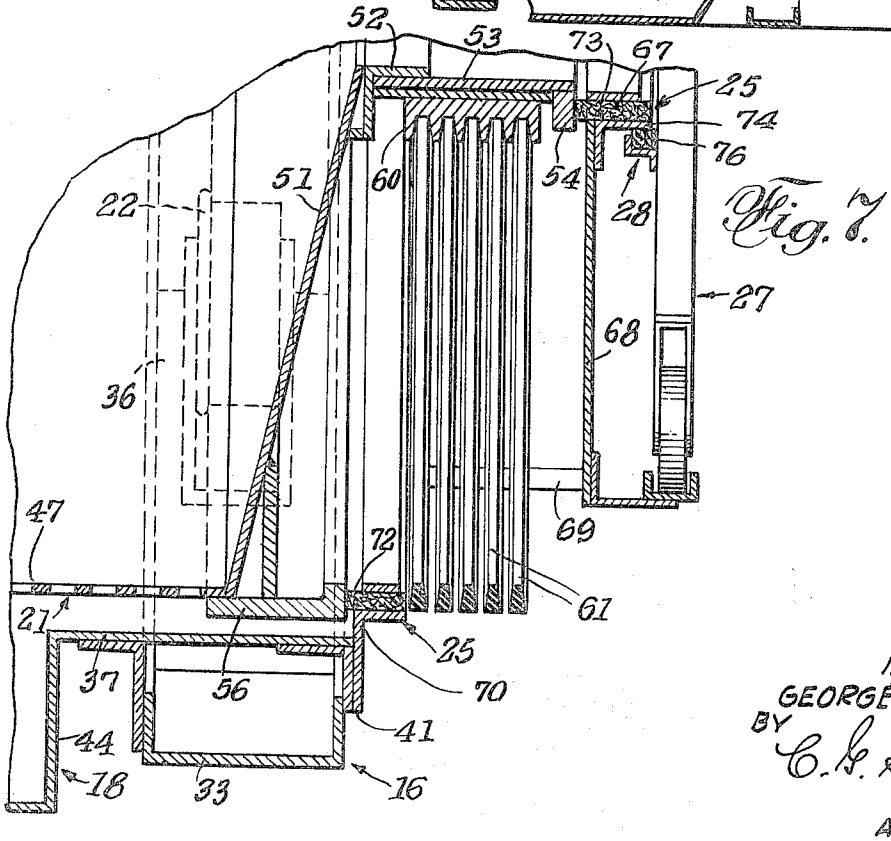


Fig. 7.

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3,316,658

TWO-SIDED TUMBLER

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5 Claims. (Cl. 34—126)

This invention relates to a laundry machine for drying wet wash by passing hot air therethrough while it is being tumbled.

An object of the present invention is to provide a tumbler of the character referred to that has three operative positions—a wet wash drying position, a loading position, and a discharge position.

Another object of the invention is to provide a tumbler in which the loading and discharge positions of the wet wash-containing tumbler drum are at oppositely tilted angles on either side of the normal level position of said drum.

A further object of the invention is to provide a tumbler, as above characterized, that is efficient and time-saving in use, in that loading of the machine takes place on one side while discharge takes place on the opposite side. Thus, movement of wet wash from moisture-extracting areas to the tumbler and to ironing areas from the tumbler, is carried out with easy facility since the traffic of the wash-carrying carts to and from the tumbler is reduced over the traffic to and from a tumbler that both feeds and discharges on the same side. This feature is particularly useful in installations having two or more tumblers in aligned relation.

This invention also has for its objects to provide such means that are positive in operation, convenient in use, easily installed in a working position and easily disconnected therefrom, economical of manufacture, relatively simple, and of general superiority and serviceability.

The above objects are realized in a tumbler that comprises two pairs of air cylinders having extensible pistons and stems in quadrangular arrangement, one pair being fixed and the other pair being pivotally mounted, and a support assembly pivotally mounted on the upper ends of the four stems of said cylinders with a circular shroud connected to said support and receptive of heated air from a duct that is also affixed to said support assembly and to the shroud. The shroud is open at the front and rear, a perforated tumbler drum being housed in the shroud with front and rear open sides that extend through the front and rear of the shroud.

The support assembly is provided with two pairs of support wheels for the drum and upon which the same rotates, rotation being effected by a drive to a rearwardly extending collar on the rear side of the drum. Said drum receives heated air from the duct and shroud, passes the same through wet wash tumbling in the drum while the drum rotates, and discharges the air through a motor-driven fan to atmosphere. Sliding doors give access to the front and rear openings of the drum and are carried by guides that are affixed to and move with the support assembly.

At the front, a sealing ring carried by the support assembly engages the rim around the front opening of the drum to seal against leakage of air from the shroud, and a sealing ring carried by the inner faces of the front doors seals against leakage of air from the front drum opening when the doors are closed. At the rear, there are similar sealing rings and also a third sealing ring that seals between the shroud and atmosphere.

The tumbling position of the machine is with the common axis of the shroud and drum horizontal, in which case the four stems of the air cylinders are fully retracted. This position may also be used for loading a cake of wet wash into the drum from a cart or truck, by sliding said

cake into the front opening of the drum. By extending the stems of the front pair of air pistons, the support assembly, together with the shroud, duct and tumbler drum, is tilted around the pivots of the stems of the rear pair of air cylinders to provide the open front of the drum with a rearward angle at the top. It is a simple matter to insert or drop a cake of water-extracted wet wash into said drum opening from above since, after insertion, the cake readily slides into the drum of its own weight. This position also provides for discharge of the tumbled material from the rear of the machine, since the rear opening of the drum is tilted at a rearward angle at the top so that the drum contents readily empty rearwardly, the rear doors, of course, being open. By extending the stems of the rear pair of air pistons, said support assembly and the components it carries are tilted around the pivots of the stems of the front air pistons, the front of the drum is forwardly tilted at the top, enabling front emptying if this is desired.

The invention also comprises novel details of construction and novel combinations and arrangements of parts, which will more fully appear in the course of the following description, which is based on the accompanying drawings. However, said drawings merely show, and the following description merely describes, one embodiment of the present invention, which is given by way of illustration or example only.

In the drawings, like reference characters designate similar parts in the several views.

FIG. 1 is a partly broken front elevational view of the two-sided tumbler of the present invention.

FIG. 2 is a similar view of the rear of the tumbler.

FIG. 3, to a larger scale, is a vertical sectional view as taken on the line 3—3 of FIG. 1.

FIG. 4 is a vertical sectional view as taken on the line 4—4 of FIG. 3.

FIG. 5 is a fragmentary sectional view of the shroud and air duct for conducting hot air to the tumbler drum.

FIG. 6 is a further enlarged fragmentary sectional view as taken on the line 6—6 of FIG. 1.

FIG. 7 is a similar view as taken on the line 7—7 of FIG. 2.

The two-sided tumbler that is illustrated comprises, generally, a base housing **10**, a pair of front air cylinders **11** fixedly mounted in said base housing, each cylinder having a vertically extensible piston stem **12**, a pair of rear air cylinders **13** mounted on hinge pins **14** to swing or pivot in the housing in a direction toward the front of the tumbler, each of the latter cylinders having a vertically extensible piston stem **15**, a support frame **16** carried by the upper ends of said four stems **12** and **15** by means of pivots **17**, a shroud **18** affixed to said frame **16**, an air duct **19** that conducts heated air supplied by a burner **20** to the interior of the shroud, a tumbler drum **21** disposed within said shroud **18**, support wheels **22** arranged as two cooperating pairs and carried by the support frame **16** on which the drum is cradled to rotate on its axis, means **23** to rotate the drum, means **24** to create suction in the shroud thereby drawing air into the duct as heated by the burner, means **25** to seal the shroud against leakage to atmosphere, doors **26** to close the drum **21** at the front, similar doors **27** to close the drum at the rear, and means **28** to seal between said doors **26** and **27** and the respective openings in the drum.

The base housing **10** is shown with a base **30**, relatively short front and rear walls **31** and **31***a* defining the front and rear of said housing, and end walls **32***a* and **32***b*, as required. A control panel **33***a* may be provided at the front, at one side, above the wall **31**, for convenient access to switches and other controls in the operation of the tumbler.

The front pair of air cylinders **11** is vertically affixed to

the base 30 in spaced relation adjacent the front wall 31, each of said cylinders having a piston therein that is raised and lowered according to which end of the cylinder is supplied with pressure air. Thus, the stems 12 of said cylinders are projected or retracted together, as desired.

The rear pair of air cylinders 13 is vertically supported from the base 30 on the mentioned hinge pins 14 which are mounted in aligned blocks 32, the pistons in the latter cylinders being raised and lowered in the same manner as the pistons of cylinders 11. Thus, the stems 15 of the cylinders 13 are projected or retracted together also.

The four cylinders are shown in a quadrangular arrangement, but the same may be modified, if desired.

The support frame 16, as shown in FIGS. 3 and 4, comprises front and rear frame parts 33 that are connected by a member 34 that extends front to rear. Said frame parts are disposed between the respective pairs of air cylinders 11 and 13, as best shown in FIG. 3, each being provided with a semi-circular seat 35 in which the shroud 18 is fitted and secured. The seats 35 have a common front-to-back axis—the axis of rotation of the drum 21.

The pivots 17 extend from the opposite ends of the frame parts 33, as shown in FIG. 4, the pivots at the front being aligned and connected to the stems 12 of cylinders 11, and those at the rear being aligned and connected to the stems 15 of the cylinders 13.

At the lower corners of both frame parts 33 are provided brackets 36 which mount the drum-cradling or support wheels 22. These brackets also impart rigidity to said frame parts and to the pivots 17 that extend from the frame parts at said corners.

The shroud 18 comprises a cylinder 37 that is partly closed at the front by a circular wall 38 having an axial opening 39 that is framed by an angle 40. At the rear, said cylinder 37 is framed by an angle 41. At the top, the cylinder 37 has a hot air inlet 42 from the duct 19, and at the bottom, an outlet 43 that leads into a tangentially extending passage 44 that connects with the air exhaust portion of the suction-inducing means 24. As shown in FIG. 1, said cylinder 37 is provided with suitable openings 45 as pass-throughs for the drum-cradling wheels 22 that are carried by the brackets 36.

The air duct 19 is open at its bottom 46 and receives the gases of combustion from the burner 20 which is located beneath said open bottom. This burner may provide gas or steam heat, as desired. The duct 19 conforms to one side of the shroud 18, as shown in FIG. 5, and conducts heated air to the inlet 42 at the top of the shroud.

The tumbler drum 21 has a perforated cylindrical wall 47 within which is provided a plurality of perforated clothes-tumbling blades or vanes 48. At the front, said drum is provided with a wall 49 having an axial opening that is edged by an annular rim 50. Somewhat similarly, the drum at the rear is provided with a wall 51 that is edged by an annular angle 52 which defines an axial opening smaller than the opening defined by rim 50. As seen best in FIGS. 3 and 7, a drive collar 53 extends rearwardly from said angle 52 and, at its rearward edge, is provided with an annular rim 54. At the front and rear edges of the cylindrical wall 47 are provided the respective bands 55 and 56 which are engaged by the wheels 22 to support the drum, as shown.

The above-described shroud, duct and drum are comparable to the same components disclosed in Patent No. 3,020,648 and have the same function of tumbling clothes or wet wash in the drum while heated air is directed through the drum contents from the inlet 42 of the shroud to the outlet 43 under suction created by the means 24 while said drum is being rotated.

The drum-rotating means 23 is shown as an electric motor 57 which is mounted on the lower wall 58 of the rear frame part 33 and drives a pulley 59 through a suitable speed reducer. The drive collar 53 mounts a pulley 60 that is driven by pulley 59 by means of suitable belting 61.

The suction-creating means is shown as an air fan 62 that is driven at high speed by a jack shaft 63 from a motor 64 by a belt drive 65. This means also is comparable to the drum-driving means of the mentioned patent.

The shroud-sealing means 25 is shown as a felt or similar ring 65 in edge contact with the drum rim 50, said ring being carried by the front outer wall 38 of the frame part 33 at the front. A similar ring 67 is provided in edge contact with the drum rim 54, the latter ring being carried by a rear wall 68 which is mounted, as by spacer studs 69, from the rear outer wall 70. The upper portions of the support frame parts 33 connect with semi-circular enclosing members 71 which are connected to the front and rear edges of the shroud 18. The front member 71 is fastened to the upper portion of the wall 38.

Since the rear wall 68 is rearwardly spaced from the wall 70, the sealing means 25 includes a felt or similar ring 72 that is carried by the latter wall and has edge engagement with the rearward edge of the wheel-engaging band 56, thereby sealing between the inside of the shroud 18 and atmosphere.

It will be clear from FIGS. 3, 6 and 7 that the sealing rings 65, 67 and 72 also constitute non-metallic thrust members that serve to locate the drum 21 against undue end movement and avoid any metal-to-metal contact between said drum and non-rotational parts of the tumbler.

The doors 26 at the front are similar to those shown in Patent No. 3,020,648. The rear doors 27 close the rear axial opening 73, defined by an angle 74 in which the sealing ring 67 is mounted, in the same way that the doors 26 close the front opening 39.

Whereas, the means 25 seals the shroud against leakage of air, the means 28 comprises sealing rings 75 and 76 at the rear, having sealing engagement with the inner faces of the doors 26 and 27 when the same are slid to closed position. FIGS. 1 and 2 show one door of each pair thereof in closed and the other in open position.

It will be clear that the full-line position of the shroud 18 and drum 21 of FIG. 3 is the tumbling position of the above-described laundry machine. By causing the stems 15 of the cylinder 13 to be extended by inlet of pressure air into the bottom of said cylinders, the shroud and drum are tilted to the angle of axis 77, enabling removal of the air-dried contents of the drum through the front opening of said drum. This is usually accomplished while the drum is being slowly rotated. By causing the stems 12 of the cylinders 11 to be extended by inlet of pressure air into the bottom of the latter cylinders, the shroud and drum are tilted to the angle of axis 78. In this position, the drum may be loaded from the front with a cake of wet wash from above, or the drum emptied from the rear. These operations may be overlapped in time, if desired. Of course, front loading with the drum axis horizontal may be had, as in the machine of the mentioned patent.

While the foregoing has illustrated and described what is now contemplated to be the best mode of carrying out the invention, the construction is, of course, subject to modification without departing from the spirit and scope of the invention. Therefore, it is not desired to restrict the invention to the particular form of construction illustrated and described, but to cover all modifications that may fall within the scope of the appended claims.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a tumbler for drying wet wash,
   (a) a rotatable wash-tumbling and -drying drum having open ends front and back and concentric with the drum axis,
   (b) means mounting the drum to rotate on said axis,
   (c) housing means in which the drum is disposed with the open ends thereof extending one through the front and the other through the rear of the housing means, and

(d) means to tilt the housing in a vertical plane to, thereby, tilt the axis of the drum in said plane.

2. In a tumbler according to claim 1, the last-mentioned means comprising:

(a) two pairs of air cylinders provided with stems that are extensible by compressed air fed to said cylinders,

(b) said cylinders being disposed in quadrangular arrangement in vertical position whereby the stems move vertically upward when extended, one pair of said cylinders being aligned at the front and the other pair at the rear of the tumbler, and

(c) pivots connecting the stems and the housing means, the axes of said pivots being disposed on parallel lines transverse to the axis of the drum.

3. In a tumbler according to claim 2, one pair of cylinders being fixed, and means pivotally mounting the other pair on a common axis that is parallel to the axes of the mentioned pivots.

4. In a tumbler according to claim 2, the pairs of cylinders being approximately vertically aligned with the open ends of the drum, the drum, thereby, assuming an angle of tilt with either end of the drum raised to elevate the raised end substantially above the ends of the drum when in untilted position.

5. In a tumbler according to claim 4, a rearwardly extending collar on the rear open end of the drum, and means to drive said collar.

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