June 12, 1951 A. TRAUBE 2,556,303

ROTARY WASHING AND DRYING MACHINE

Filed March 9, 1945 3 Sheets-Sheet 1

Fig. 1.

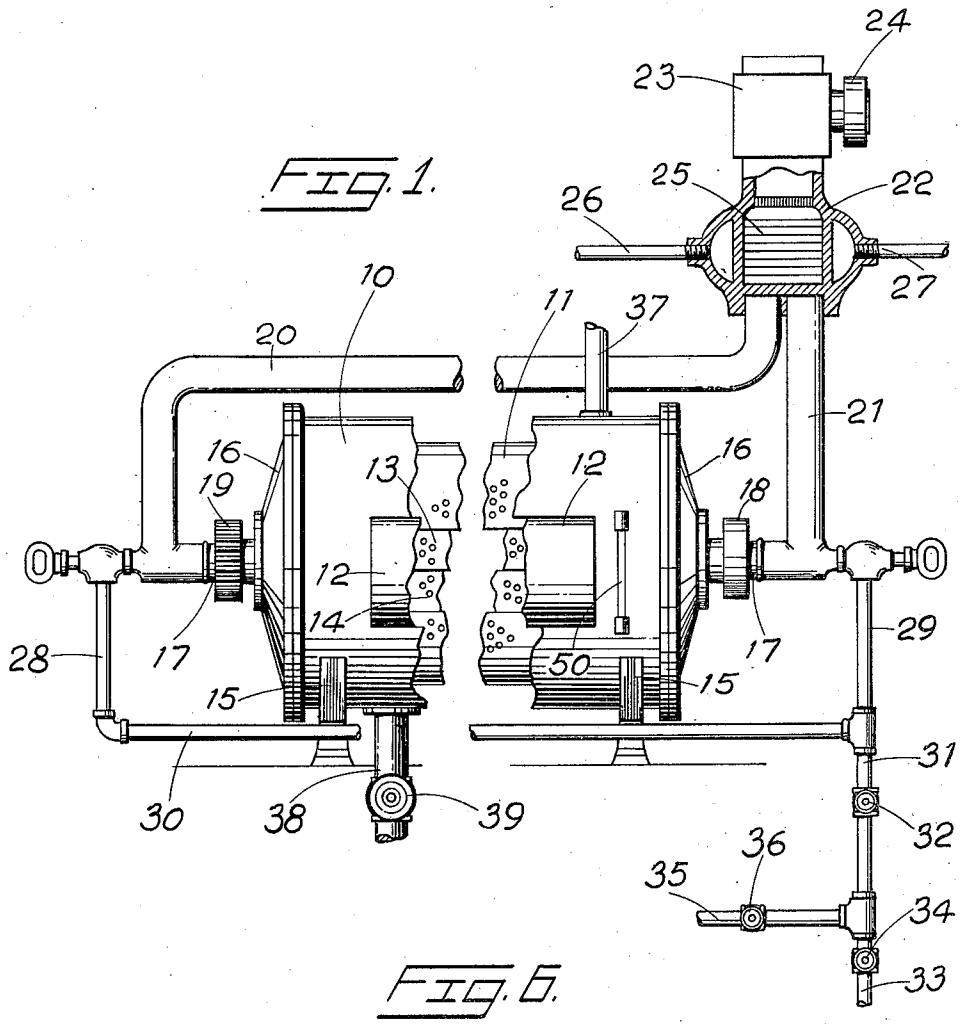
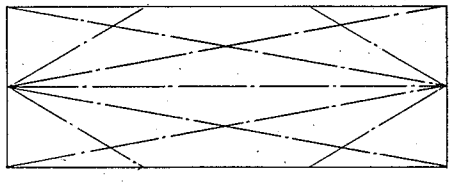


Fig. 6.



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June 12, 1951 A. TRAUBE 2,556,303

ROTARY WASHING AND DRYING MACHINE

Filed March 9, 1945 3 Sheets-Sheet 2

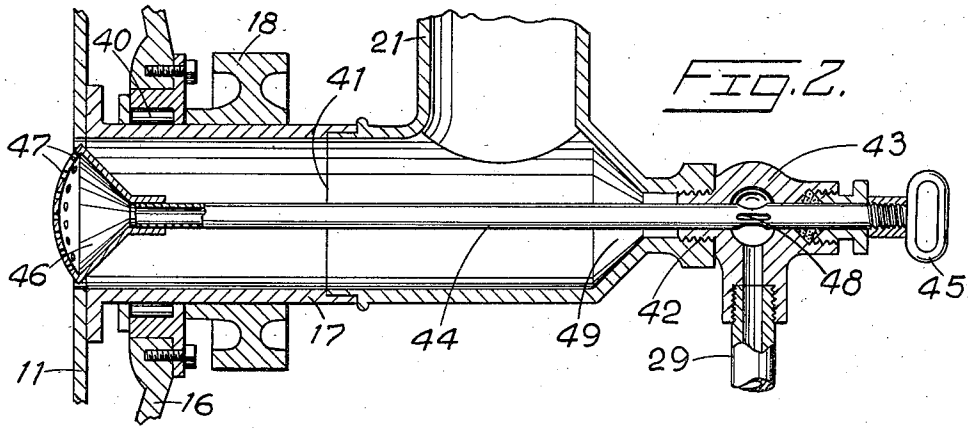


Fig. 2.

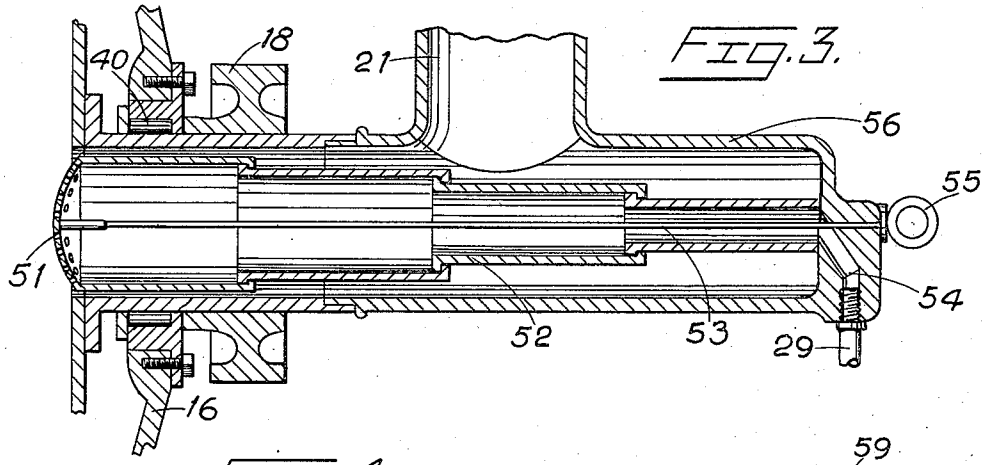


Fig. 3.

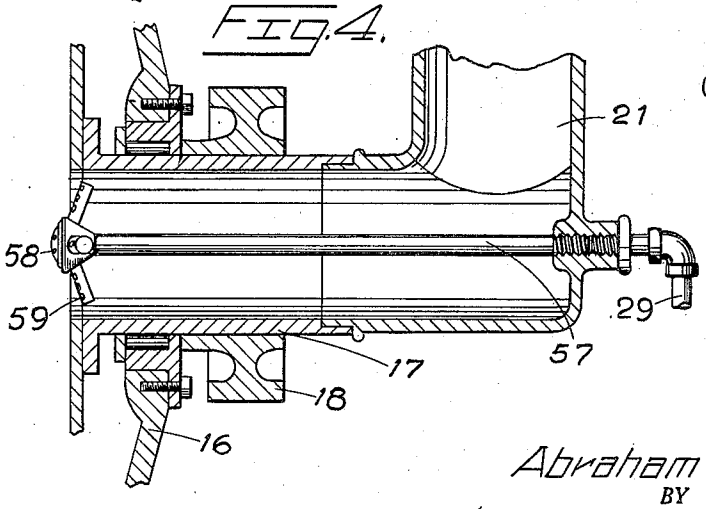


Fig. 4.

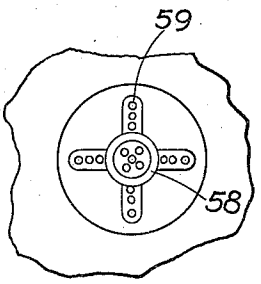


Fig. 5.

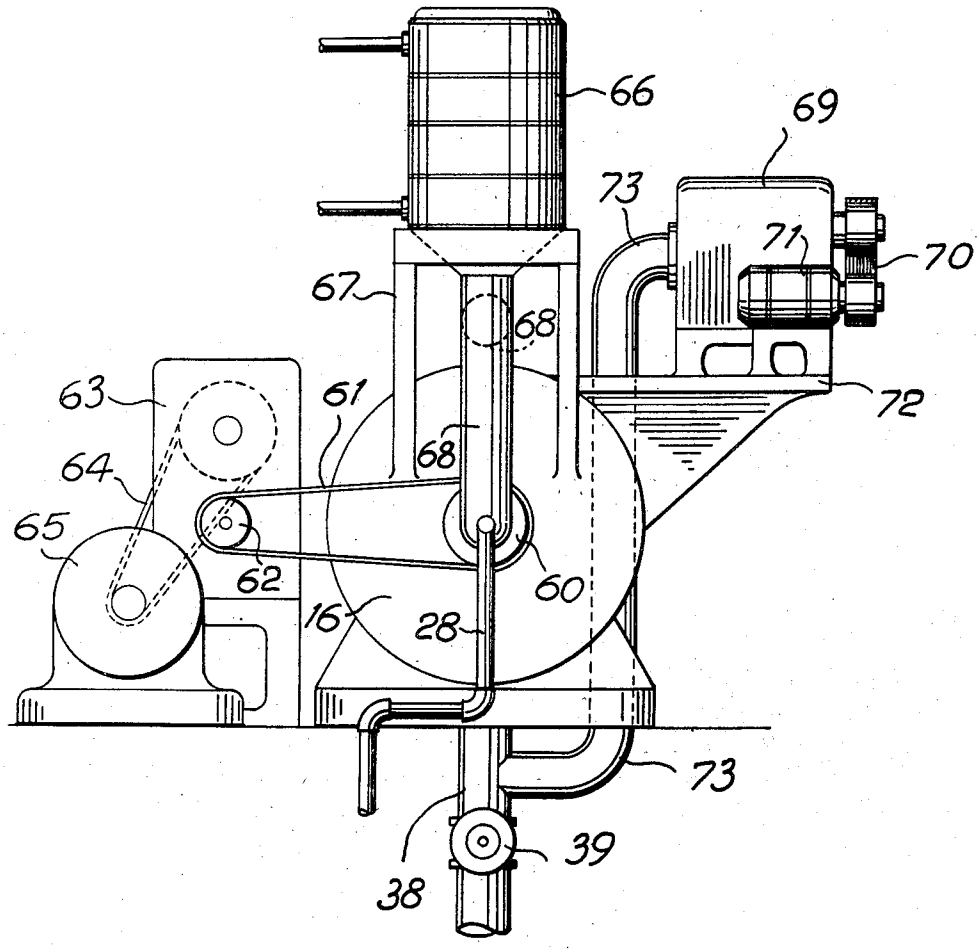
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Filed March 9, 1945 3 Sheets-Sheet 3

Fig. 7.



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ROTARY WASHING AND DRYING MACHINE

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Application March 9, 1945, Serial No. 581,771

2 Claims. (Cl. 68—20)

1

This invention relates to rotary machines for use in washing or "dry-cleaning" clothes and other articles and for use also, and more particularly, in the drying of such articles in the same rotary containers. More specifically the invention relates to a machine of the type having a perforated drum mounted to rotate about a horizontal axis within a fixed container or casing, and adapted for relatively slow rotation in a bath of cleaning fluid and for subsequent rotation at high speeds to extract the said fluid by centrifugal action.

One object of the present invention is to provide new or improved means whereby the same machine may be utilized for washing or "dry-cleaning" clothes or the like and also for rinsing and finally drying the same without the necessity for transference of the clothes from one machine to another. Another object of the invention is to provide improved means whereby rinsing fluid may be supplied to the axis of the rotary drum while extraction is taking place under centrifugal action, and to provide improved means whereby the drying of the clothes is facilitated by the delivery of hot dry air to the axis of the rotary drum during the extraction process; and still another object is to provide the said drum with hollow trunnions with improved means for the admission and control of rinsing liquid and of drying air.

The improved means for the delivery of the rinsing spray and for the subsequent drying operation effects a substantial saving in time, labor, and expense and experiments have shown that improved results are also obtained.

With the above and other objects in view, the present invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes may be made in the constructional details without departing from the spirit of the invention or sacrificing any of the advantages thereof.

In the drawings Fig. 1 is a front view of one form of the machine; Fig. 2 is a detail view, in section, showing one of the hollow trunnions with its associated parts; Fig. 3 is a view corresponding to Fig. 2 but showing a modified form of spray control; Fig. 4 is a somewhat similar view but showing a different spray and fluid supply means; Fig. 5 is an end view of the spray device shown at Fig. 4; Fig. 6 is a diagram showing the lines followed by the opposed sprays inwardly directed from the two hollow trunnions; and Fig. 7 is an end view showing a modified form of the machine.

2

The machine shown in the drawings is of the type described in my prior patents numbered 1,740,716 and 2,126,426 and the fixed outer casing 10 and inner rotary drum 11 are provided with hinged doors similar to those described in the patent numbered 2,291,511, the casing 10 having a single door 12 and the drum 11 having twin doors 13, 14, capable of withstanding centrifugal force when the drum rotates at a speed up to seven hundred revolutions per minute.

Referring to Fig. 1 the machine casing 10 is mounted horizontally on supporting brackets 15 and in its end walls 16 it supports hollow trunnions 17 of the drum 11 so that the latter may rotate about a horizontal axis. One of the trunnions 17 is provided with a pulley 18 while the other is provided with a toothed wheel 19, and suitable driving means transmit rotary motion to one or other of these wheels to rotate the drum 11 slowly in one direction after the other during the washing or cleaning operation and to rotate the drum at high speed in one direction during the extracting process, as described in my said prior patents, but any suitable means may be provided for the transmission of the desired motion to the drum.

For the supply of clean dry heated air to the axis of the drum during the extracting or drying operation, two air ducts 20, 21 lead from a casing 22 one to each of the trunnions 17. Air is supplied to the casing 22 by means of a blower 23 actuated by a pulley 24 and—within the casing—the air passes in contact with a coil or a group of tubes 25 heated by internal steam supplied by a pipe 26 and exhausted by an escape pipe 27 so that air at the desired temperature may be supplied to the drum at the desired pressure.

For the supply of rinsing water or other fluid to the axis of the drum two water pipes 28, 29 lead to the trunnions 17, these pipes being connected with each other by a pipe 30 and being supplied through a pipe 31 having a control valve 32, and rinsing fluid is supplied to said pipe 31 by a pipe 33 having a control valve 34 and, if so desired, a pipe 35 with a control valve 36 may be provided to supply cleaning fluid, suds, or chemical mixtures to the pipe 31 for introduction into the drum through its trunnions instead of through the usual admission pipe 37 at the top of the casing 10. For the discharge of fluids from the machine a drain pipe 38 is provided and a control or dump valve 39 may be closed to retain

the fluid during the washing or cleaning operation.

Referring to Fig. 2, the trunnion 17 is shown mounted in bearings 40 in the end wall 16 of the casing, and the outer extremity of the trunnion receives the mouth 41 of the duct 21. In line with the axis of the drum the duct 21 is formed with a socket to receive a screw-threaded end 42 on a connection 43 to which liquid is supplied by the said pipe 29. Extending through the connection 43 is a hollow rod 44 having a handle 45 at its outer end and carrying on its inner end a spray head 46 with perforations 47 designed to direct the spray in an axial direction and outwardly towards the clothes contained in the drum and forced outwardly by centrifugal force. In the position shown at Fig. 2 the rod 44 is supplied with water through openings 48 located within the connection 43 in line with the pipe 29, and the inner extremity of the trunnion 17 is closed by the head 46. When the rod 44 is drawn outwardly by means of the handle 45 the water supply is cut off and the head 46 is accommodated in the recess 49 so that a free passage is provided for the admission of air through the duct 21.

In the operation of this machine for the washing of clothes and the like, the articles to be washed are introduced through the doors 12, 13, 14, and, after said doors and the valve 39 have been closed, the cleaning fluid including the desired mixture of soap or chemicals may be introduced either through the pipe 37 or through the trunnions by way of the pipe 35 or through both these pipes simultaneously, and the liquid level in the machine may be observed through the gage 50. The drum is then rotated at low speed first in one direction and then in the other until the completion of the washing operation, and the liquid is then drained off through the pipe 38, after which the drum is rotated at high speed to throw off by centrifugal force the soiled liquid held by the clothes and, at the same time, rinsing liquid is sprayed into the trunnions 17 so that the soiled liquid is followed by rinsing liquid until all soil has been removed from the clothes. The supply of rinsing liquid is then cut off and while the drum continues to rotate at high speed, clean dry heated air may be supplied through the trunnions to dry the clothes in the drum.

Fig. 3 shows a modified form of the spray device comprising a perforated spray head 51 carried by a series of telescopic sections 52 enclosing an operating rod 53 and supplied with liquid through a passage 54 from the pipe 29 and when it is desired to deliver drying air through the duct 21 the rod 53 may be drawn outwardly by means of its handle 55 until the sections 52 are all accommodated within the off-set portion 56 of the air supply duct.

Figs. 4 and 5 show a further modification in which the supply pipe 29 delivers the spray liquid to a fixed pipe 57 supported at its outer end in the air duct and carrying at its inner extremity a spider comprising a central hollow head 58 and four angularly projecting pipes 59 having their free ends plugged, and the said head 58 and pipes 59 are perforated in such manner as to direct the spray in the desired direction and free passage of drying air from the duct 21 to the trunnion 17 is permitted without the necessity of withdrawing the said spider from the trunnion.

Fig. 6 shows diagrammatically the approximate direction of the sprays facing each other at both ends of the drum and it will be readily understood that the spray liquid is absorbed by the clothes in the rapidly rotating drum and passes outwardly therethrough by centrifugal force and the cylindrical layer of clothes receives uniformly satisfactory treatment by the rinsing liquid with the result that complete removal is effected of any loose soil that might be left in the clothes after the extraction of the washing or cleansing liquid.

Referring to Fig. 7, which shows a machine having modified means for the actuation of the rotary drum and for the supply of drying air thereto, the internal parts are similar to those above-described with reference to Fig. 1 and the operation is substantially the same. In this modified arrangement the rotary drum has a single belt pulley 60 which may be driven by a belt 61 from a pulley 62 to which the desired motion is imparted from a gear set of any suitable or well-known construction enclosed within a gear box 63 and power is transmitted to this gear set by means of a belt 64 from an electric motor 65, and by actuation of the gear controls the drum may be caused to turn first in one direction and then the other at slow speed for the washing operation and also if desired for the air-drying operation hereinafter described, so that the clothes in the drum are tumbled about during the washing and part of the drying operation. The said gear is also adapted for the transmission of continuous motion at high speed for the centrifugal operations of rinsing and extracting above-described. For the supply of drying air, an air heater 66 is mounted on a bracket 67 on the end wall 16 of the casing and is provided with a suitable coil or the like for the heating medium. From the heater 66 ducts 68 lead to the hollow trunnions of the machine and, in operation, the heated air is drawn through these ducts into the drum by the action of a fan or other blower 69 operated through a belt gear 70 by an electric motor 71. The fan 69 and motor 71 are mounted on a bracket 72 on the end of the machine and a duct 73 leads from the fan to the outlet pipe 38 at the bottom of the casing so that the hot drying air may be drawn into and through the drum while the clothes are being tumbled over during the slow forward and reverse motion of the drum or while the drum is rotating at high speed and the clothes are being subjected to centrifugal force. The dump valve 39 is opened to drain off the washing and rinsing water, but is closed while the drying air is being drawn through the machine by the action of the fan 69.

Although the drawings and the above specification disclose the best modes in which I have contemplated embodying my invention, I desire to be in no way limited to the details of such disclosure for in the further practical application of my invention many changes in constructional details may be made as circumstances require or experience suggests without departing from the spirit of the invention within the scope of the appended claims.

What I claim is:

1. A machine of the character described for washing or dry-cleaning clothes and like articles, comprising a fixed outer casing, a hollow rotary drum mounted within the casing and having end walls and a perforated cylindrical wall and enclosing a space for the accommodation of said articles without interruption at the axis of the drum, hollow trunnions on said end walls communicating with the interior of the drum and extending through the walls of the casing, means for the supply of cleaning fluid to the casing, a

spray head located in the inner extremity of the hollow trunnion at each end of the drum for directing sprays of rinsing liquid against the said articles in the interior of the drum, said sprays being directed outwardly from the axis of the drum and in angular relation thereto while the drum is rotated at a speed sufficient to discharge such rinsing liquid centrifugally through the said cylindrical wall, a hollow control rod connected to and extending outwardly from each of said spray heads, means for the supply of rinsing liquid through said rods to said heads when the latter are in the operative position, and ducts for the supply of drying air to the outer extremities of both said hollow trunnions for admission to the ends of the drum after the spraying operation.

2. A machine of the character described for washing and dry-cleaning clothes and like articles, comprising a fixed outer casing, a hollow rotary drum mounted within the casing and having end walls and a perforated cylindrical wall enclosing a space for the accommodation of said articles without interruption at the axis of the drum, hollow trunnions on said end walls communicating with the interior of the drum and extending through the walls of the casing, means for the supply of cleaning fluid to the casing, a spray head located in the inner extremity of the hollow trunnion at each end of the drum for directing sprays of rinsing liquid to the interior of the drum in direction outwardly from the axis of the drum and in angular relation thereto while

the drum is rotated at a speed sufficient to discharge such rinsing liquid centrifugally through the cylindrical wall, telescopic means for the conveyance of liquid to said heads, handles connected to said heads for the collapse of said telescopic members and for the withdrawal of said heads from the trunnions, and ducts for the supply of drying air to the outer extremities of both said hollow trunnions for admission to the ends of the drum after the spraying operation.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
100,120	Cook	Feb. 22, 1870
246,547	Patterson	Aug. 30, 1881
774,407	Venter	Nov. 8, 1904
854,415	Glasel	May 21, 1907
1,591,779	Reedy	July 6, 1926
1,948,568	Faber	Feb. 27, 1934
2,004,419	Schumacher	June 11, 1935
2,098,066	Sibson	Nov. 2, 1937
2,101,634	Aldridge	Dec. 7, 1937
2,126,426	Traube	Aug. 9, 1938

FOREIGN PATENTS

Number	Country	Date
12,693	Great Britain	1898