Feb. 24, 1953

E. E. HALLANDER

2,629,243

DRY CLEANING APPARATUS

Filed Oct. 7, 1947

4 Sheets-Sheet 1

Fig. 1

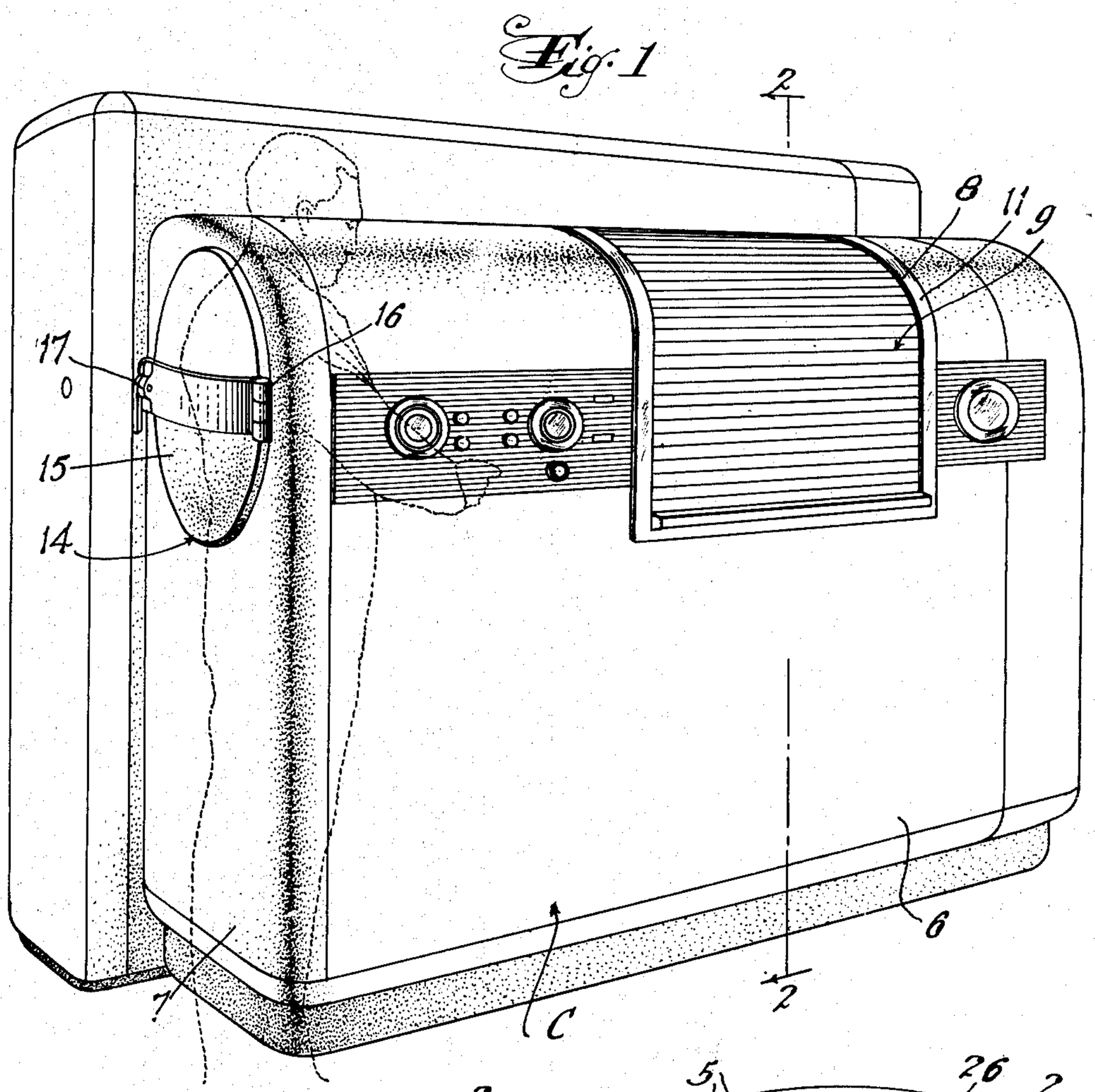


Fig. 4

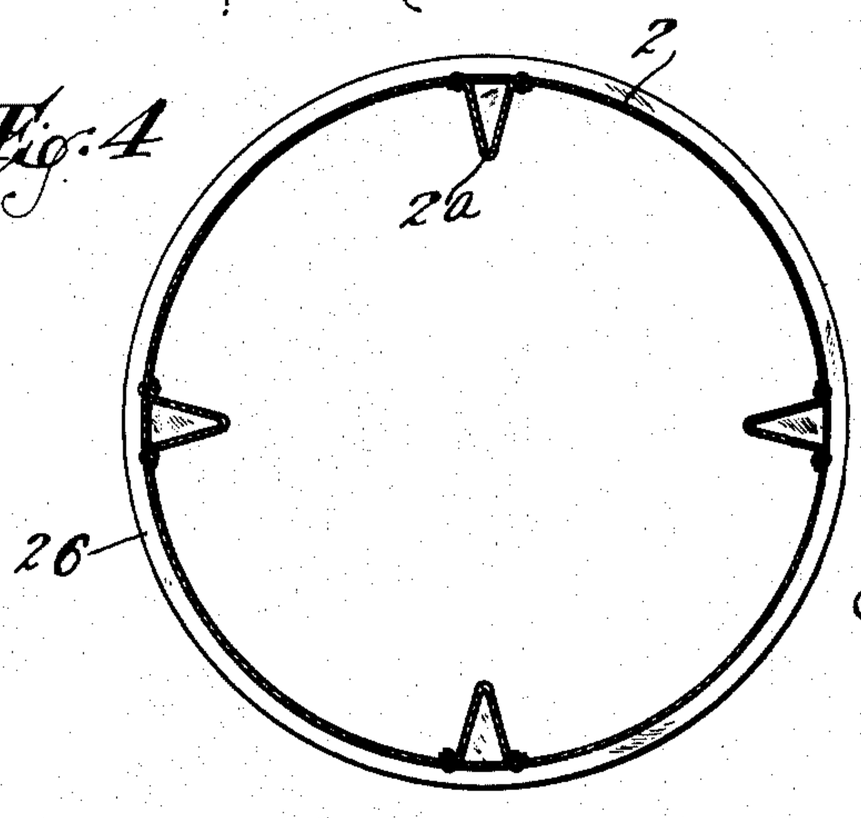
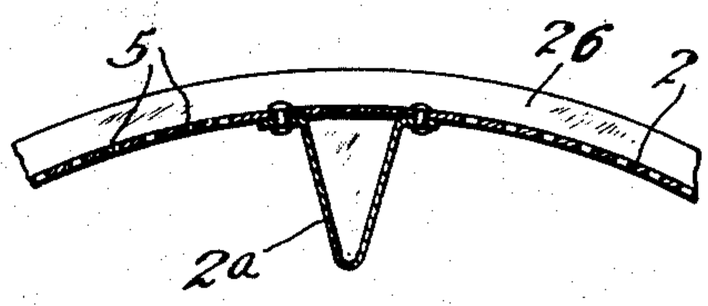


Fig. 5



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DRY CLEANING APPARATUS

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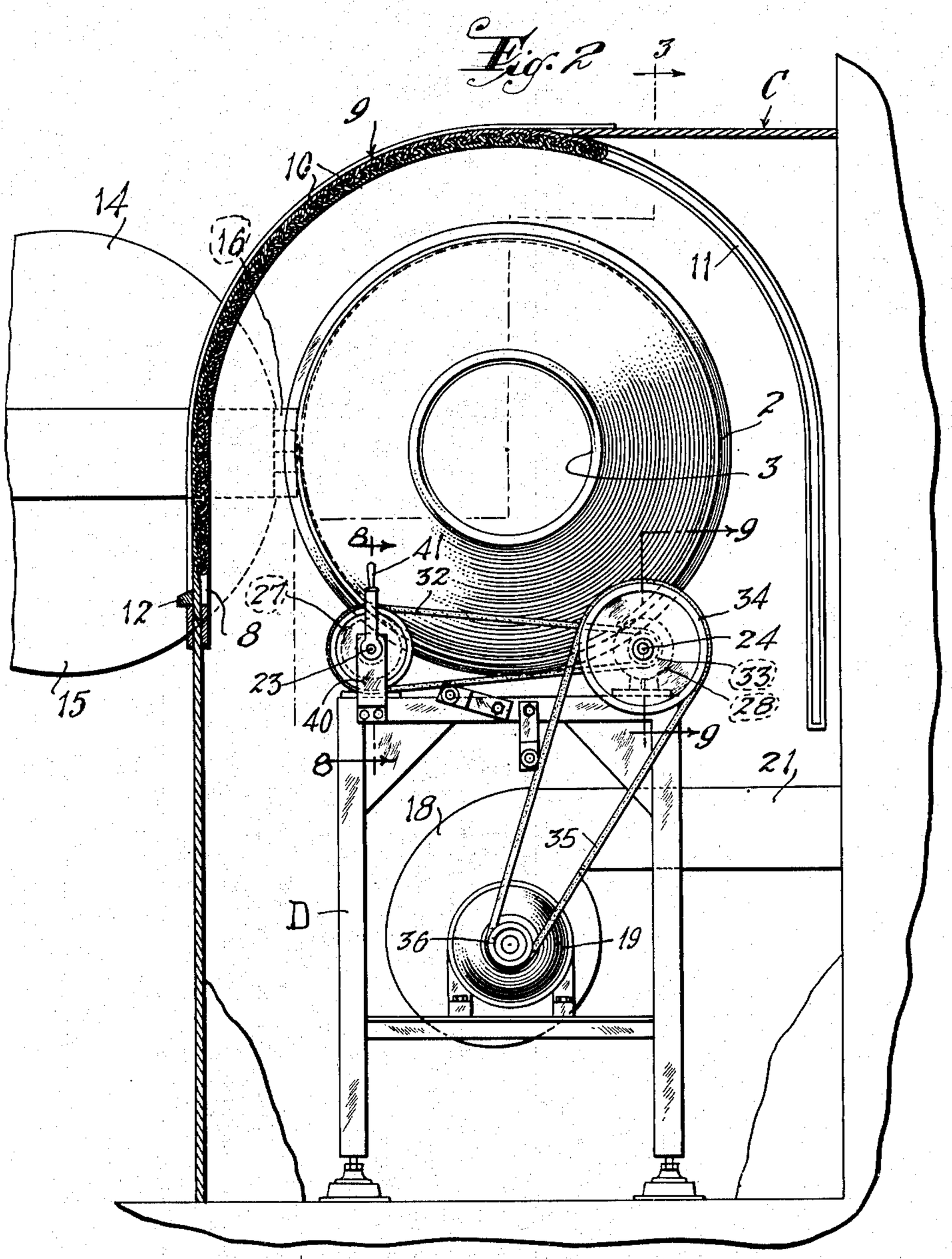
Fig. 2



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DRY CLEANING APPARATUS

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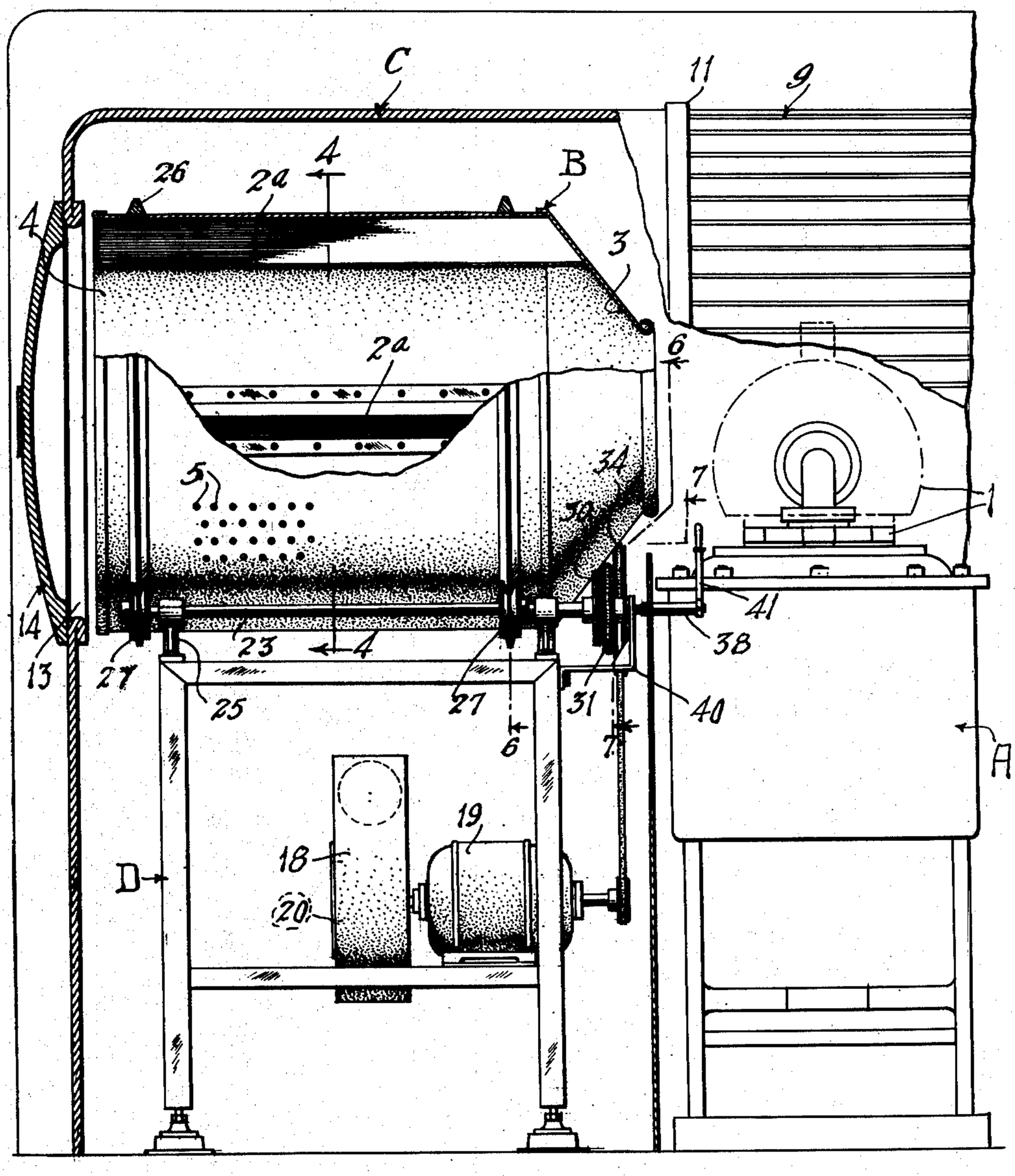

Fig. 3

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DRY CLEANING APPARATUS

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Fig. 6

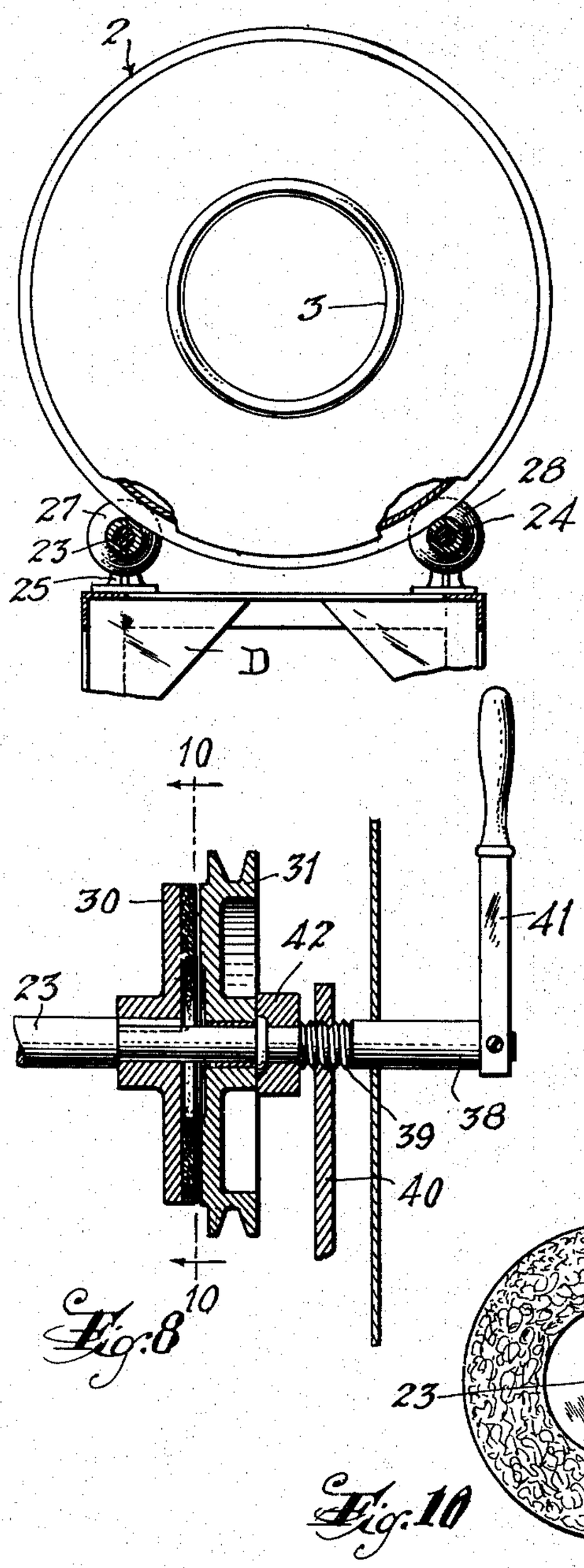

Fig. 8

Fig. 7

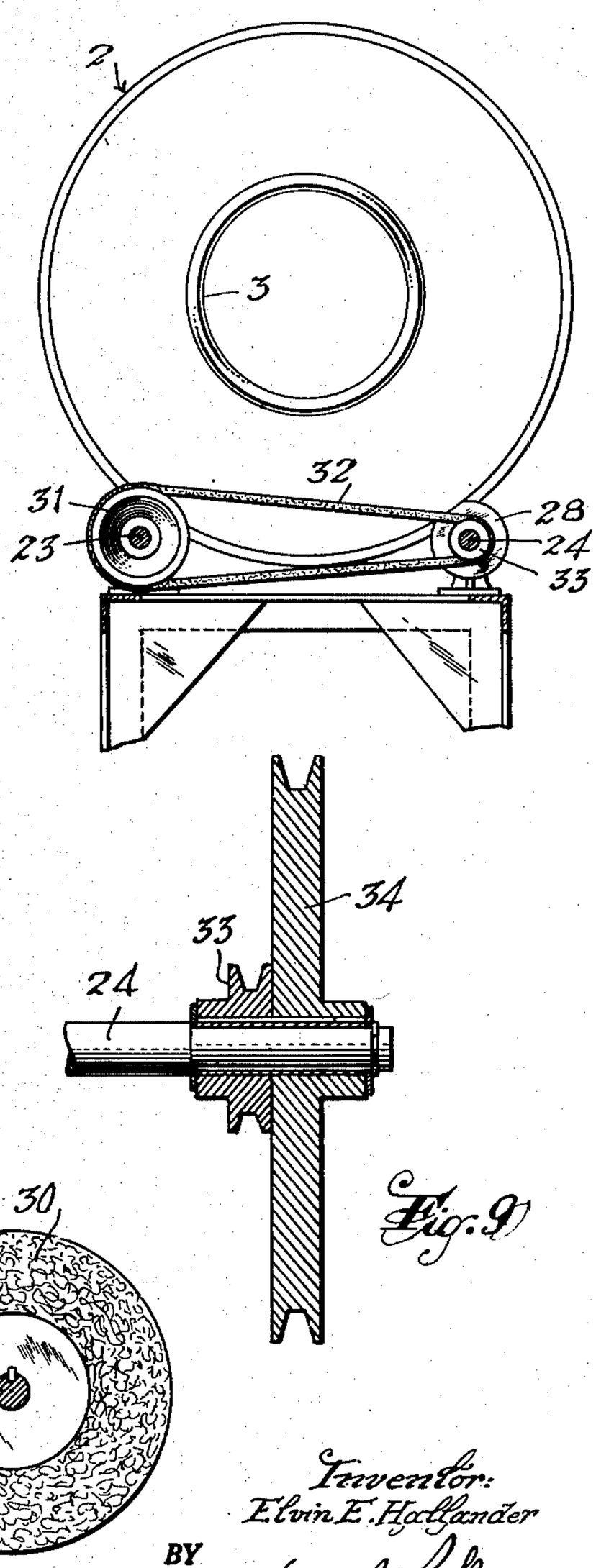

Fig. 9

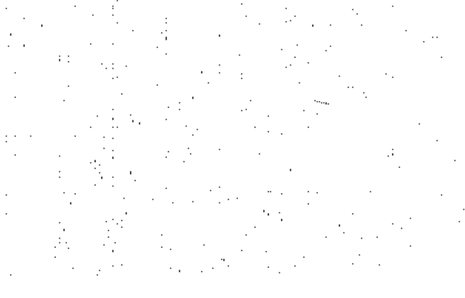

Fig. 10

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UNITED STATES PATENT OFFICE

2,629,243

DRY CLEANING APPARATUS

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Application October 7, 1947, Serial No. 778,424

3 Claims. (Cl. 68—19)

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This invention relates in general to apparatus for washing and drying clothes or similar articles, and more particularly contemplates apparatus comprising a washer, an extractor and a drier.

One object of the invention is to provide apparatus of this character which will include a normal and improved construction, combination and arrangement of a combined washer and extractor, a tumbler or drier, and a common housing whereby the washer and extractor and the tumbler shall be accessible from the exterior of the housing and the clothes or materials being washed can be directly transferred from the washer and extractor to one opening in the tumbler and removed from another opening in the tumbler while the tumbler is rotating, thus permitting continuity of and simple operations which result in high speed and efficiency.

Another object is to provide a tumbler or drier which shall be devoid of shafts or trunnions so as to provide a maximum of capacity for materials being dried, cause a minimum of interference with the movement of the materials in the tumbler during the drying operation, and allow easy and quick insertion and removal of materials or clothes to be cleaned.

A further object is to provide a tumbler or drier which shall embody novel and improved features of construction whereby the articles or materials to be dried can be easily and quickly inserted into one end of the tumbler and removed from the other end while the tumbler is in operation so as to permit rapid and continuous drying.

Other objects are to provide a novel and improved construction and combination of a tumbler drum and a housing therefor having door openings and doors so that the articles to be dried can be inserted into the drum through one of said door openings and removed from the other door opening while the drum is in motion; to provide novel and improved means for driving the tumbler and for easily and quickly starting and stopping operation thereof, and to obtain other advantages and results that will be brought out by the following description in conjunction with the accompanying drawings, wherein:

Figure 1 is a front perspective view of a dry cleaning apparatus embodying my invention;

Figure 2 is a transverse vertical sectional view, approximately on the plane of the line 2—2 of Figure 1;

Figure 3 is a fragmentary vertical longitudinal

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sectional view, approximately on the plane of the line 3—3 of Figure 2;

Figure 4 is a transverse vertical sectional view, approximately on the plane of the line 4—4 of Figure 3;

Figure 5 is an enlarged fragmentary sectional view of a portion of the tumbling drum;

Figures 6 and 7 are sectional elevational views, taken approximately on the planes of the lines 6—6 and 7—7, respectively, of Figure 3;

Figure 8 is an enlarged fragmentary transverse vertical sectional view, approximately on the plane of the line 8—8 of Figure 2;

Figure 9 is a similar view, on the plane of the line 9—9 of Figure 2, and

Figure 10 is a transverse vertical sectional view, on the line 10—10 of Figure 8.

Specifically describing the illustrated embodiment of the invention, and with particular reference to Figures 2 and 3 of the drawings, my apparatus includes a washer or extractor, or a combined washer and extractor A and a drier generally designated B. I prefer to use a combined washer and extractor wherein the articles or materials are first washed in a rotating basket or container and are then drained or partially dried by elevation of the basket or container and rapid continuous rotation thereof which centrifugally separates the liquid from the materials being cleaned. As shown on the drawing, this washer and extractor has an opening in its top normally closed by a cover 1, which is shown in closed position by solid lines, and may be opened or swung upwardly into open position, as shown by dot and dash lines. The details of construction of the washer and extractor form no part of my invention and need not further to be described.

The drier B comprises a tumbler drum 2 which is mounted to rotate about a horizontal axis and has a coaxial opening 3 at one end and another coaxial opening 4 at the other end. One of the openings, in the present instance the opening 3, is the receiving opening and preferably is smaller in diameter than the interior of the drum, so as to restrain the articles being cleaned from falling out of the drum. The other opening 4 is of a diameter substantially the same as the interior diameter of the drum, and constitutes the discharge opening. The drum is perforated, as indicated at 5, and has a plurality of internal agitators or ribs 2*a* which will cause shaking or tumbling of the articles in the drum during rotation thereof.

The drum is arranged with its receiving open-

ing 3 in close juxtaposition to the opening of the washer and extractor so that articles or materials can be lifted from the extractor and transferred directly through the opening 3 into the drum. Generally this is a manual operation and only a minimum of energy is required to make the transfer of the articles from the extractor to the drier.

The washer and extractor and the drier are enclosed in a common housing C which has front and end walls 6 and 7, respectively, disposed in angular relation to each other. In the front wall and closely adjacent to the opening of the washer and extractor and the receiving opening of the drum, is a door opening 8 having a suitable door 9. The door may be of any suitable form, but preferably is a flexible sliding door, as shown, comprising a plurality of hingedly connected strips or slats 10 whose ends are slidable in guideways 11 in the housing. The door has a suitable hand grip 12 for manipulating it. When the door 9 is open, the operator can easily reach into the housing and transfer the articles or materials under treatment from the extractor to the drum.

One end wall 7 of the housing is closely adjacent the discharge end of the drum 2 and has a door opening 13 and a door 14 therefor, said opening being in alignment with the tumbling drum and the door extending transversely of said opening in closely spaced relation to the end of the drum so as normally to prevent articles from falling out of the drum when the door is closed. The door thus serves both as a closure for the door opening 13 and to prevent accidental dislodgment of the articles under treatment from the drum. Any suitable door may be used, but, as shown, the door comprises a circular plate 15 hingedly connected at 16 to the housing and having a suitable latch 17 for holding it in closed position.

With this construction, when it is desired to remove the articles or materials from the drum, the operator need only to open the door 15, reach into the drum, and pull the articles therefrom, and this may be done while the drum is rotating. At the same time, other articles may be deposited into the drum through the receiving opening.

It will be understood by those skilled in the art that the cleaning fluids utilized in dry cleaning operations are highly volatile and sometimes toxic, and consequently, I provide means for withdrawing such fumes from the housing or for preventing the escape of fumes from the housing. As shown, this means comprises a centrifugal pump 18 driven by an electric motor 19, whose inlet 20 communicates with the interior of the housing and whose outlet is connected to a conduit 21 for leading the fumes out of the housing.

Peripheral mounting and driving means is provided for the drying drum so that the drum shall be devoid of all trunnions and shafts that would interfere with the handling of the materials during the drying operation. As shown, two parallel horizontal shafts 23 and 24 are journaled in bearings 25 on a frame 26 at opposite sides of a vertical diametrical plane of the drum. The shaft 23 has two rollers 27 keyed thereon and rotatable therewith, while the shaft 24 has rollers 28 freely rotatable thereon, the rollers being spaced longitudinally of the respective shafts so as to underlie the drum 2 adjacent the ends of the latter. The shaft 23 is driven so that

upon rotation thereof the rollers 27 will frictionally drive the drum while the rollers 28 will idly rotate on their shaft 24; and desirably, all of the rollers are circumferentially grooved to receive circumferential tracks 29 on the drum.

For driving the shaft 23, I have shown a clutch disk 30 keyed thereon with which cooperates a combined clutch and pulley member 31 which is freely rotatable on the shaft, as best shown in Figure 8, and is driven by a belt 32 from a pulley 33 which is rigidly connected to a large pulley 34 that is in turn driven through a belt 35 from a pulley 36 on the shaft of an electric motor 19 which is mounted on the frame D beneath the tumbling drum. The two pulleys 33 and 34 are freely rotatable on the shaft 24.

For causing engagement and disengagement of the pulley-clutch member 31 with the clutch disk 30, I have shown a thrust rod 38 which is screw threaded at 39 in a bracket 40 that is secured on the frame 26, the outer end of said thrust rod having a handle 41 for rotating the rod, while the other end has rigidly secured thereto a thrust head or bushing 42 that is adapted to abut the pulley-clutch member 31 at the side thereof opposite the clutch disk, as shown in Figure 8. The shaft 23 has a proper thrust bearing.

Normally, the thrust rod 38 will be in position to release the pulley-clutch member 31 from contact with the clutch disk 30, as shown in Figure 8, so that the tumbling drum is at rest although the motor may be continuously running. When it is desired to start rotation of the drum, the thrust rod 38 is rotated by the handle 41 to force the thrust head 42 against the pulley-clutch member 31 and cause frictional contact thereof with the clutch disk 30 and thereby start rotation of the roller shaft 26 so as to drive the rollers 27 and thus rotate the tumbling drum. To quickly stop rotation of the tumbling drum, it is merely necessary to rotate the thrust rod 38 in the other direction to release the pulley-clutch member 31 from the clutch disk 30.

From the foregoing, it will be observed that my invention permits the rapid and efficient transfer of articles being cleaned from an extractor or washer to a drier with a minimum of escape of fumes and with a minimum of manual effort. Also, the articles to be dried can be easily and quickly tossed into one end of the drum and removed from the other end of the drum while the drum is rotated, due to the coaxial relation of the openings 3 and 4 to the drum and the absence of shafts and trunnions for mounting the drum. Moreover, the particular relationship of the end of the drum to the door 14 makes it possible to eliminate any closure or article-restraining means on the drum itself, and thereby facilitates the removal of the articles from the drum.

While I have shown and described the apparatus as embodying certain details of construction, it is understood that this is primarily for the purpose of disclosing the now preferred embodiment of my invention, and that many modifications and changes may be made in the construction of the apparatus within the spirit and scope of the invention.

I claim:

1. A dry-cleaning apparatus comprising an extractor having an opening for insertion and removal of articles, a tumbler cylinder rotatable about a horizontal axis and having a coaxial

charging opening at one end which is exposed close to said opening of said extractor so that an operator with his hands can lift articles through said extractor opening and directly transfer and deposit them into said charging opening of the tumbler cylinder, a common housing enclosing said extractor and said tumbler cylinder and having angularly related front and end walls, said front wall being disposed parallel to the axis of said tumbler cylinder, a door opening and a door therefor adjacent both said extractor opening and said charging opening of the tumbler cylinder to provide access through said door opening by the hands of the operator simultaneously to said extractor opening and to said charging opening of the tumbler cylinder, peripheral supporting and driving means for rotating said tumbler cylinder so that said tumbler cylinder and said charging opening are unobstructed throughout their areas to permit easy and quick passage of articles therethrough, and means for drawing fresh air through said door opening and around said extractor and tumbler cylinder and for exhausting foul air from the housing.

2. A dry-cleaning apparatus comprising an extractor having an opening for insertion and removal of articles, a hollow cylindrical perforate tumbler drum having a coaxial charging opening at one end and a coaxial discharging opening at the opposite end, peripheral supporting and driving means mounting said tumbler drum for rotation about a horizontal axis with said charging opening exposed close to said opening of said extractor so that an operator with his hands can lift articles from said extractor opening and directly transfer and deposit them into said charging opening of the tumbler drum while the latter is rotating, a common housing enclosing both said extractor and said tumbler drum and having angularly related front and end walls, a door opening and a door therefor in said front wall of the housing adjacent and to provide access by the hands of the operator simultaneously to said extractor opening and to said charging opening of the tumbler drum, a door opening in said end wall adjacent and in alignment with the discharge opening of said tumbler drum, and a door in said door opening adjacent said discharging opening of said tumbler drum which when closed extends transversely of said discharging opening in closely spaced relation to the end of the tumbler drum to prevent escape of articles from said tumbler drum and which when open permits removal of the articles from said tumbler drum through said door opening, and means for drawing fresh air into the housing through each door opening and around said extractor and tumbler drum when the door is open and for continuously exhausting foul air from the housing.

3. A dry-cleaning apparatus as defined in claim 2 wherein the charging end of said drum has an outwardly projecting frusto-conical wall, said charging opening is disposed in said wall and is of a smaller diameter than the interior of the drum while said discharging opening is of approximately the same diameter as the interior of the drum.

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