

Aug. 6, 1929.

J. H. RICHARDS

1,723,441

MACHINE FOR CLEANING FRUIT

Filed June 20, 1927

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Fig. 7.

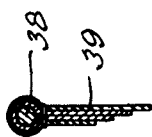
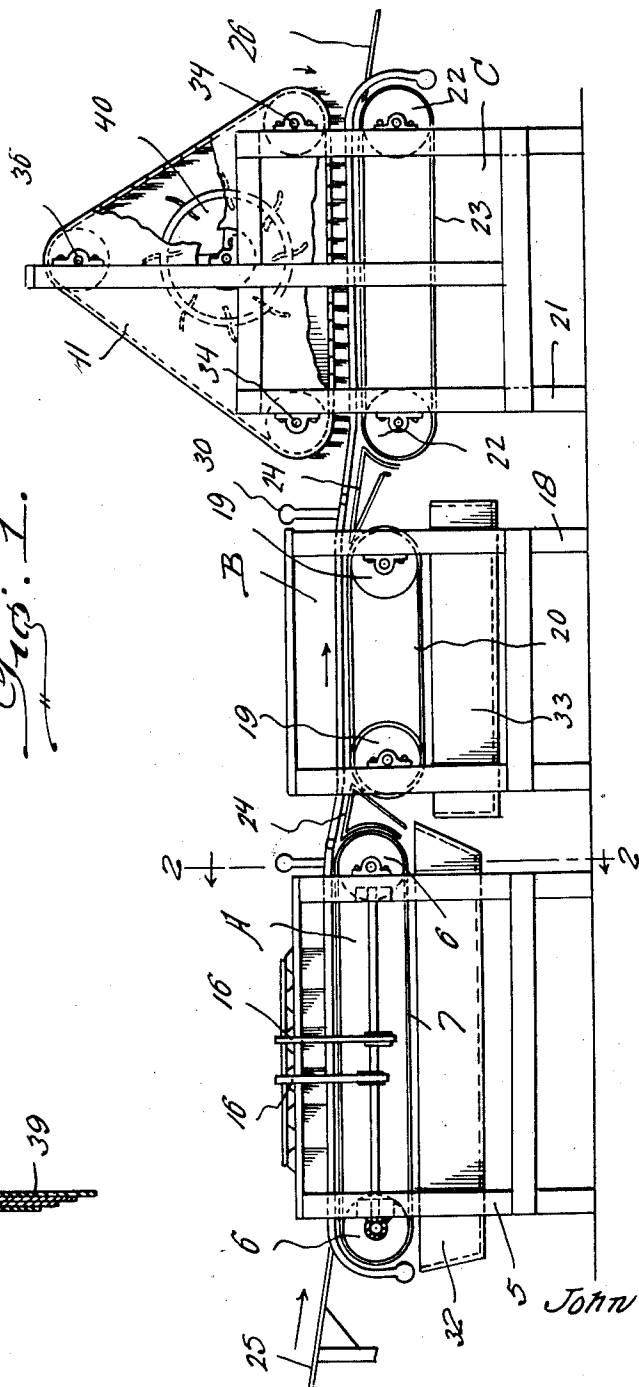


Fig. 1.



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Fig. 4.

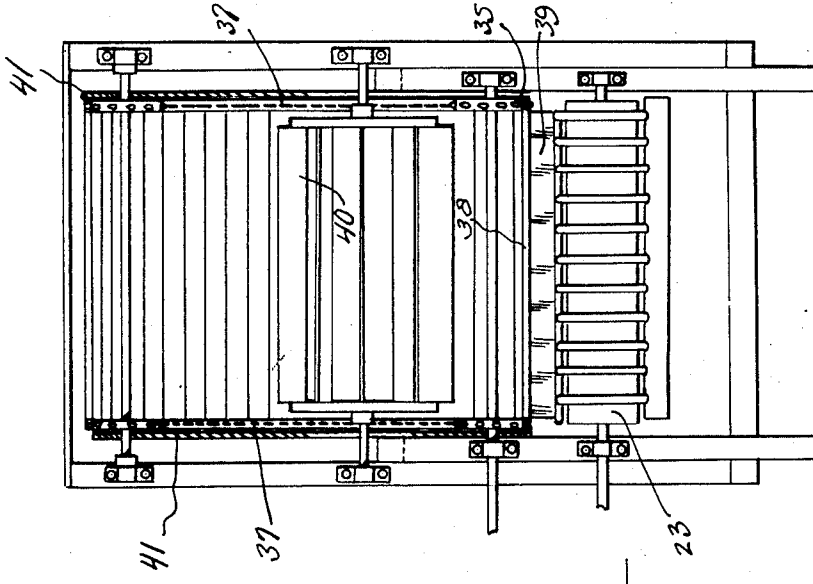


Fig. 2

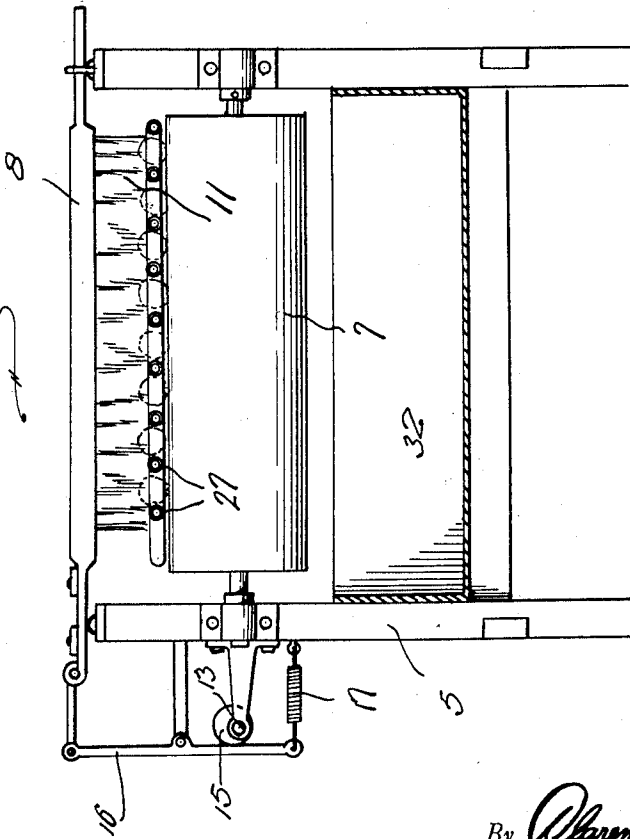
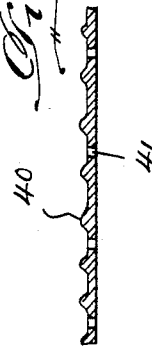


Fig. 3.



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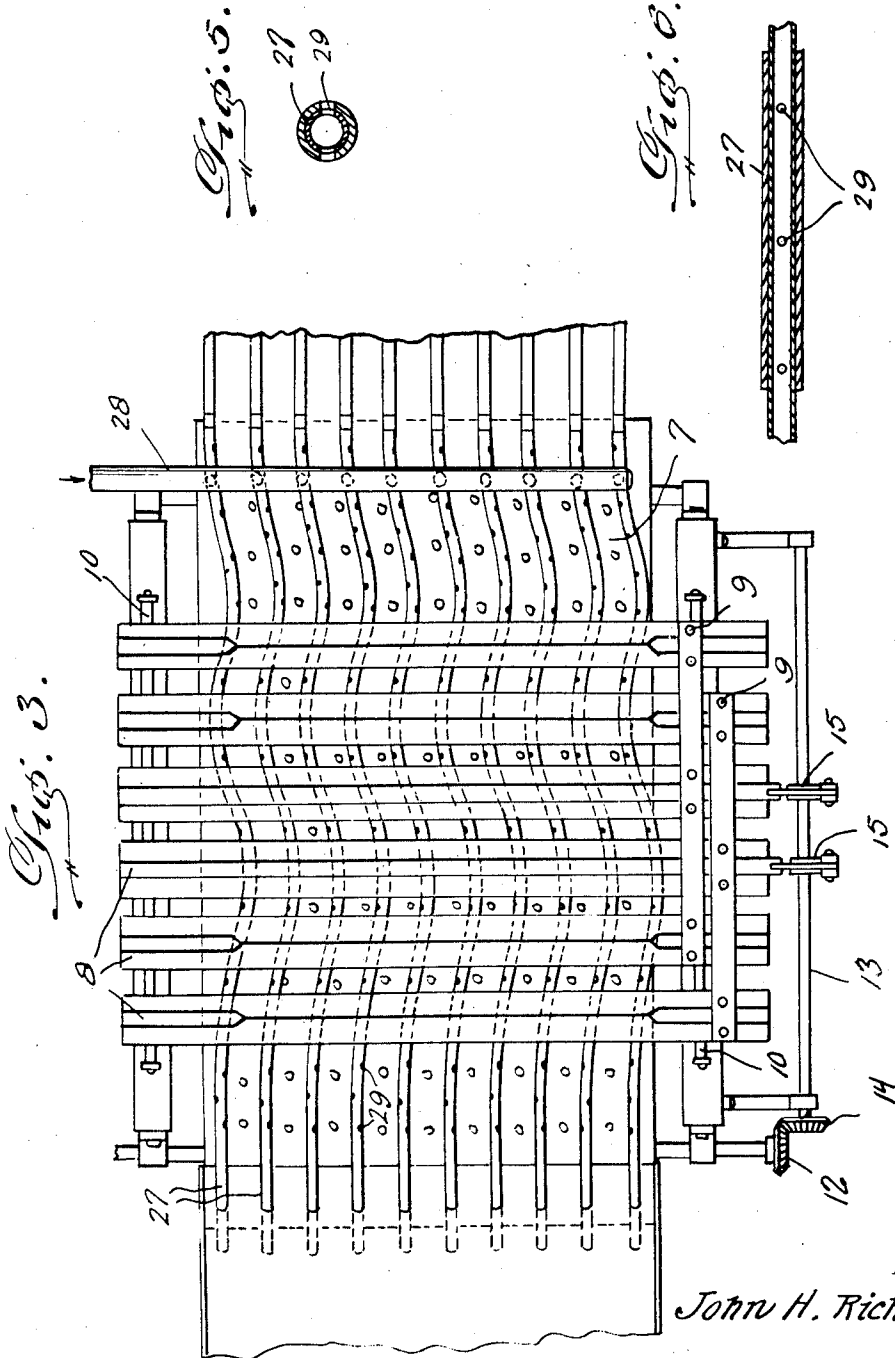
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MACHINE FOR CLEANING FRUIT

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE.

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MACHINE FOR CLEANING FRUIT.

Application filed June 20, 1927. Serial No. 200,065.

This invention relates to new any useful improvements in machinery for use in the washing of fruit, vegetables, eggs or any other commodity of that nature which requires cleaning before being placed on the market, the invention aiming to provide a relatively simple and efficiently operating device, wherein the articles are first passed through a chemical treating action and then a washing action, and finally a brushing and drying action, so that the articles may be shipped in proper and marketable condition.

The invention is characterized by means extending throughout the entire length of the apparatus to cause the turning of the articles during their longitudinal travel throughout the machine and while being subject to a suitable chemical bath, the washing bath and cleaning operation, with the obvious results that the articles are treated, wiped and cleaned throughout their entire surfaces.

An additional feature of my improved machine resides in the provision of transversely actuating cleaning units engageable with the fruit or vegetables during the treating operation; this feature being provided in order that the entire surface of the articles will be cleaned of dirt and other impurities.

In the drawings, wherein for the purpose of illustration is shown the preferred embodiment of my invention,

Figure 1 is a side elevation of my improved machine.

Figure 2 is a detail vertical section on an enlarged scale, and taken substantially on the line 2—2 of Figure 1 and looking toward the left in the direction of the arrows.

Figure 3 is an enlarged fragmentary top plan of the chemical solution treating unit.

Figure 4 is a view partially in vertical section and partially in rear elevation of the wiping and drying unit of the machine.

Figure 5 is a detail transverse section through one of the spaced parallel pipe members that extend throughout the entire length of the machine, and

Figure 6 is a fragmentary longitudinal section thereof.

Figure 7 is a detail transverse section

through one of the cross carrying bars of the machine wiping and drying units, and

Figure 8 is a transverse section through the character of the endless belt that is preferably provided in the three units of the machine.

Now having particular reference to the drawings, wherein there is disclosed the most preferred embodiments of this invention with which I am at this time familiar, the machine consists of three main units designated generally A, B, and C. These units are arranged in slightly spaced longitudinally extending manner as clearly indicated in Figure 1. The unit A is provided for the purpose of projecting a suitable chemical solution onto the fruit, vegetables or other articles passed therethrough and at the same time for wiping the articles while passing therethrough and in a direction at right angles to the direction of travel. The unit B is the unit provided for washing the chemical solution from the articles, while the unit C is provided for drying the articles, so that they may be conveniently packed after being passed through the machine.

The unit A includes a rectangularly shaped open frame 5, equipped at its ends and adjacent its top side with transversely extending belt drums 6—6 around which travels an endless conveyor belt 7. These drums are mounted upon suitable shafts journaled in bearings associated with the frame, while one end of the outer shaft is extended beyond the frame, so that power may be applied thereto in any manner desirable, and this to cause the travel of the belt around the drums in a direction toward the right.

Mounted transversely across the top of the frame 5 and supported thereon in any suitable anti-frictional manner are the longitudinally spaced parallel bars 8, alternate ones thereof being connected by metallic straps or bars 9—9, so that certain ones of these bars will be caused to travel transversely in unison, while the others will also be caused to travel in unison but separately from the first mentioned ones. The anti-frictional support for these bars preferably

consists of longitudinal rollers 10—10 upon the top of the opposite sides of the frame, as clearly indicated in Figures 2 and 3. Suitably attached to the under sides of these bars are depending cleaning clothes 11 that terminate slightly above the top run of the belt 7, so as to encounter the fruit or vegetables passing therebeneath.

The end of the outermost drum shaft opposite to that from which power is applied is equipped with a bevelled gear 12, while horizontally supported upon the frame 5 outwardly of the ends of the drums 6—6 is a shaft 13, the inner end thereof being equipped with a bevelled gear 14 having mesh with the gear 12. This shaft 13 carries a pair of spaced cam rollers 15—15, while pivoted to suitable brackets projecting outwardly from the frame 5 above the shaft 13 are rocker arms 16—16, the upper ends thereof being suitably connected to the two series of cleaning cloth carrying bars 8. The lower ends of these before mentioned rocker arms 16—16 are connected to the machine frame 5, by retractile coil springs 17 for causing the movement of the two series of bars 8, in one direction. The shape of the cams 15—15 are such that one arm 16 will be rocked by its cam, while the other arm will be actuated by its spring 17, and vice versa. By reason of this arrangement, the series of bars are caused to travel transversely in reverse directions, so that the fruit or vegetables encountered by the cleaning cloths 11 will be wiped throughout their entire surfaces.

The unit B also consists of a frame 18, within which is mounted a pair of longitudinally spaced transversely extending drums 19—19 over which is trained an endless conveyor belt 20, either one of said drums being power driven so that the belt will be caused to travel in the direction of the arrow indicated in Figure 1.

The unit C also consists of a suitable frame 21, within which is mounted a pair of longitudinally spaced transversely spaced drums 22—22 over which is arranged an endless conveyor belt 23. Suitably means such as that indicated by the reference character 24—24 in Figure 1 is provided between the units A and B and B and C, directly at the upper runs of the various belts 7, 20 and 23, to cause the fruit from the belt 7 to travel onto the belt 20 and from the belt 20 of the unit B onto the unit of the belt C. Furthermore, a suitable inclined chute board 25 is provided for the unit A to cause the movement of the articles onto the belt 7, while a suitable chute board 26 is provided at the discharge end of the unit C to cause the proper movement of the articles from its belt.

Extending throughout the entire length of the machine comprised by the units A, B,

and C are spaced parallel hollow pipes 27, that are bent into zig-zag shape as indicated in Figure 3, to cause the rolling of the fruit or vegetables during their longitudinal movement by the belts 7, 20 and 23, directly below the hollow pipes 27. A tube 27' of rubber or any other material surrounds each pipe 27 to protect the fruits or vegetables undergoing treatment from being bruised. This arrangement is more clearly illustrated in Figures 5 and 6 of the drawing.

These pipes 27 are of spaced relation slightly greater than the diameter of the fruit, vegetables or the like passing through the machine and serve as guide rails for said fruit or vegetables to prevent the lateral movement of the same upon the belts for a distance greater than the spaced relation of said pipes.

As indicated in Figure 1, these pipes have their ends bent slightly downwardly in spaced relation with the end drums 6 and 22 of units A and C so that the articles may freely move onto the belt 7 and pass from the belt 23. Between the units A and B, the pipes are plugged while the pipes at the inner end of the unit A are connected by a transversely extending manifold pipe 28 that has communication at one end with a source of liquid chemical solution. The sides of the pipes between the belt drums 6—6 of the unit A are formed with openings 29. The rubber covering 27' of each pipe 27 is provided with the openings 29' that are in registration with the respective openings 29 formed in the pipe 27. The openings in the outermost pipes and the covering therefor are only upon the inner sides thereof and obviously by reason of these openings the solution will be caused to project onto the articles moving between the pipes. By reason of the cleaning units, the solution will be wiped upon the surface of the articles to remove therefrom dirt and other foreign matter. Furthermore, by reason of the zig-zag formation of the pipes, throughout the units A, B, and C, the articles traveling through the machine will be moved diagonally in opposite directions causing the turning thereof so that the entire surfaces will be acted upon.

At the far end of the unit B, the pipes 27 are again connected with a transversely extending header pipe 30 that has communication at one end with a source of water under pressure, the pipes within this unit B being also provided with openings at their sides, so that the water will be projected against the articles to wash therefrom the chemical solution projected thereagainst during the travel through the unit A. The pipes between the units B and C are plugged, so that the water will not flow into the pipes throughout the area of the same extending through the unit C.

The unit A is provided between its endless belt with a catch basin 32, while the unit B is provided beneath its conveyor with a catch basin 33, and if desired, these basins may have communication with the source of chemical solution and the washing fluid so that the same will not be wasted.

Mounted transversely within the frame 21 at the opposite ends and above the belt drums 22—22 are shafts 34—34 the ends of which are equipped with sprocket gears 35. Mounted into position above these shafts and at a point intermediate the same is a transverse shaft 36 that is equipped within its ends with sprocket gears as clearly disclosed in Figure 4.

Trained around the sprocket gears at opposite ends of the shafts 34—34 and 36 are endless chains 37—37, that are interconnected by cross bars 38, disposed around which are lengths of absorbent fabric 39, the edges of which depend from the bars so that as the same move into position in parallel relation above the conveyor belt 23, the edges of the cloth will have wiping engagement with the fruit, vegetables or other articles passing through the unit C.

Within the side chains 37—37 there is rotatably mounted a central feed peripheral projecting blower 40 for driving air against the drying clothes 39, so that those having wiping engagement with the articles will be forced thereagainst, while those which have passed beyond the belt 23 will receive the force of the air to cause the drying thereof.

Preferably at the outer sides of the chains 37—37 are triangular shields 41—41 formed at the ends of the blower 40 with circular openings so that air may be sucked there-through.

Power may be applied to one end of either of the shafts 34—34 or 36 to cause the movement of the chains in the direction indicated by the arrow in Figure 1, that is, reversely to the direction of travel of the fruit or vegetables resulting in the complete wiping and drying of the articles.

It will thus be seen that I have provided a highly novel, simple and efficiently operating machine for treating, washing and drying fruit, vegetables and the like, and even though I have herein shown and described the invention as consisting of certain detail structural elements, it is nevertheless to be understood that some changes may be made therein without affecting the spirit and scope of the appended claims.

The endless belt of each unit may be and preferably is so constructed as to provide ribs 42 upon the outer surface of the belt. Furthermore, each unit belt is formed throughout its length with perforations 43 to permit fluid to pass therethrough, see Figure 8.

Having thus described my invention, what I claim as new is:

1. In a machine of the character described, a frame, an endless conveyor arranged horizontally within the frame, longitudinally extending spaced pipes arranged within the frame directly above the conveyor and between which the fruit or vegetables will travel, said pipes being bent in parallel zig-zag formation to cause a diagonal movement of the fruits or vegetables in a reverse direction, resulting in the rolling thereof, a chemical solution supply manifold for all of said pipes, the inner sides of said pipes being provided with discharge openings, so that the solution will project upon the fruits or vegetables during movement through the pipes, and means being located transversely upon the top side of the frame to cause the wiping of the solution onto the surface of the fruit or vegetables.

2. In a machine of the character described, a frame, an endless conveyor arranged horizontally within the frame, longitudinally extending spaced pipes arranged within the frame directly above the conveyor and between which the fruit or vegetables will travel, said pipes being bent in parallel zig-zag formation to cause a diagonal movement of the fruits or vegetables, in a reverse direction, resulting in the rolling thereof, a chemical solution supply manifold for all of said pipes, the inner sides of said pipes being provided with discharge openings, so that the solution will project upon the fruits or vegetables during movement through the pipes, and means being located transversely upon the top side of the frame to cause the wiping of the solution onto the surface of the fruit or vegetables, said means consisting of reciprocating bars, and depending wiping cloths associated with said bars and terminating directly above the solution pipes.

3. In a machine of the class described, a frame, an endless conveyor belt arranged horizontally therein, apertured pipes arranged horizontally above the belt, said pipes being disposed in parallel zig-zag relation with respect to each other to effect a rotary movement to be imparted to the material passing between the pipes along the upper flight of the conveyor belt, and a liquid supply pipe communicating with said aforementioned pipes.

4. In a machine of the class described, a frame, an endless conveyor belt arranged horizontally therein, apertured pipes arranged horizontally above the belt, said pipes being disposed in parallel zig-zag relation with respect to each other to effect a rotary movement to be imparted to the material passing between the pipes along the upper flight of the conveyor belt, a liquid supply pipe communicating with said afore-

mentioned pipes, and means on the machine for movement over the material to wipe the fluid ejected from the apertured pipes onto the material that moves through the frame
5 on said belts.

5. In a machine of the class described, a frame, an endless conveyor belt arranged horizontally within the frame and longitudinally thereof, spaced apertured pipes arranged longitudinally above the conveyor belt and adapted to eject a liquid supplied to the pipes onto the material carried by the upper flight of the belt, reciprocating bars mounted on the frame above said pipes, and
15 wiping elements depending from each of said bars for contact with the material to wipe the liquid over the surface of the material.

6. In a machine of the class described,
20 a frame, an endless conveyor belt arranged horizontally within the frame and longitudinally thereof, spaced apertured pipes arranged longitudinally above the conveyor belt and adapted to eject a liquid supplied
25 to the pipes onto the material carried by the upper flight of the belt, a plurality of bars arranged transversely on the frame above said pipes, wiping elements depending from each bar for engagement with the material
30 on the upper flight of the conveyor belt for wiping the liquid over the surface of said material, and means for actuating said bars, said means comprising a shaft journaled for rotation on the frame and arranged longitudinally with respect thereto, a rocker arm
35 pivotally supported intermediate its ends on the frame, said bars being interconnected for simultaneous operation, an operative connection between the upper end of the rocker arm and said bars, a retractile spring
40 connecting the lower end of said rocker arm

to the frame, and a cam on the shaft for engagement with the rocker arm to periodically swing the upper end portion thereof inwardly against the tension of the retractile
45 coil spring.

7. In a machine of the class described, a frame, an endless conveyor belt arranged horizontally within the frame and longitudinally thereof, spaced apertured pipes arranged longitudinally thereof, spaced apertured pipes arranged longitudinally above the conveyor belt and adapted to eject a liquid supplied to the pipe onto the material carried by the upper flight of the belt, a
55 plurality of bars arranged transversely on the frame above said pipes, wiping elements depending from each bar for engagement with the material on the upper flight of the conveyor belt for wiping the liquid over the
60 surface of said material, and means for actuating said bars, said means comprising a shaft journaled for rotation on the frame and arranged longitudinally with respect thereto, a rocker arm pivotally supported
65 intermediate its ends on the frame, said bars being interconnected for simultaneous operation, an operative connection between the upper end of the rocker arm and said bars, a retractile spring connecting the lower end
70 of said rocker arm to the frame, a cam on the shaft for engagement with the rocker arm to periodically swing the upper end portion thereof inwardly against the tension of the retractile coil spring, said apertured pipes being disposed in such a manner
75 as to effect the rotation of the material during the feeding of the same through the machine.

In testimony whereof I affix my signature.

JOHN H. RICHARDS.