

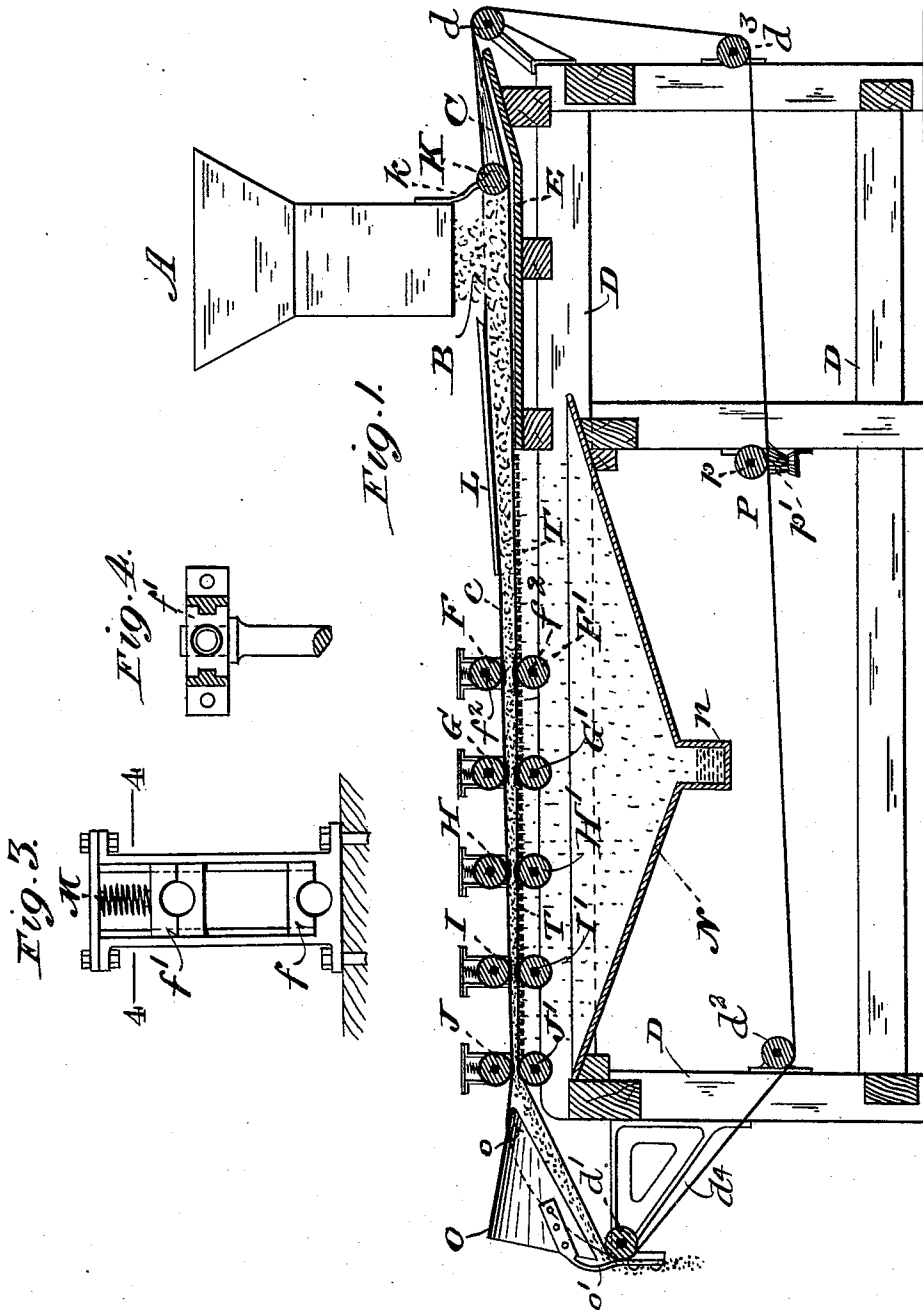
(No Model.)

2 Sheets—Sheet 1.

J. L. ROHRER.
CIDER MILL.

No. 457,217.

Patented Aug. 4, 1891.



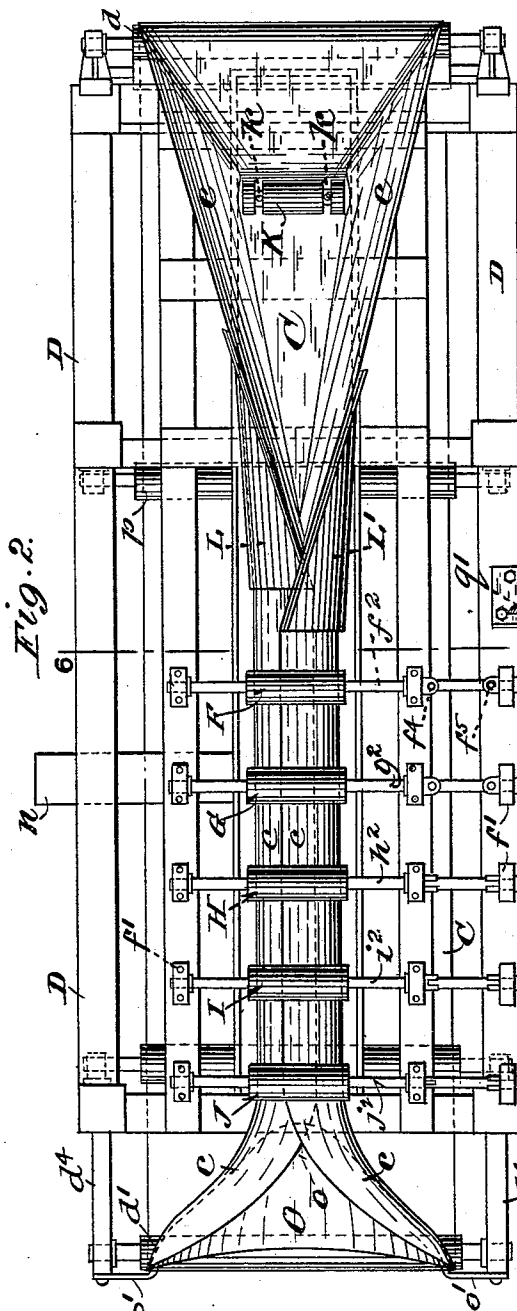
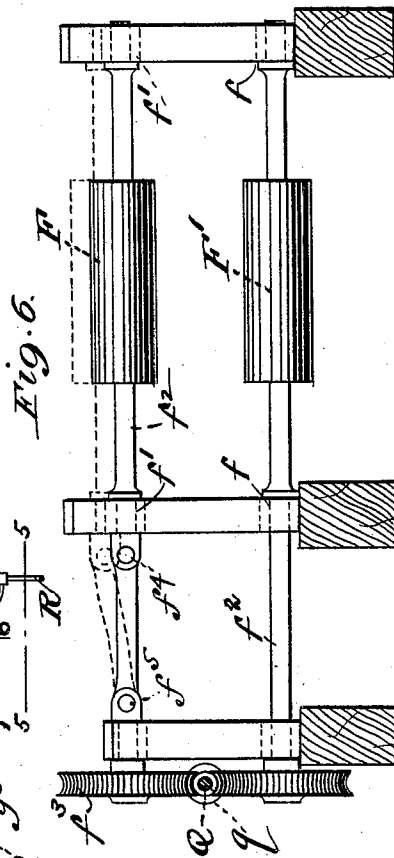
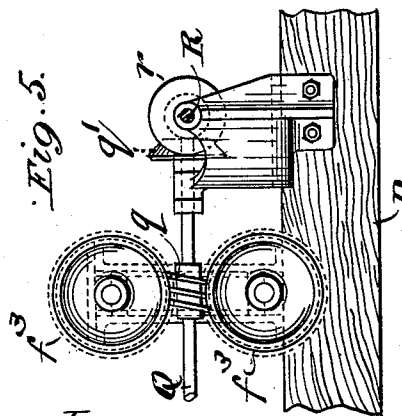
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UNITED STATES PATENT OFFICE.

JACOB L. ROHRER, OF PALMYRA, MISSOURI.

CIDER-MILL.

SPECIFICATION forming part of Letters Patent No. 457,217, dated August 4, 1891.

Application filed January 19, 1891. Serial No. 378,341. (No model.)

To all whom it may concern:

Be it known that I, JACOB L. ROHRER, of Palmyra, Missouri, have made a new and useful Improvement in Cider-Mills, of which the following is a full, clear, and exact description.

In the present improved construction the ground apple is fed from the mill onto a traveling belt. The belt is spread out to receive the apple; but after the belt in its movement has passed the mill it is by means of suitable appliances folded into a tubular form, and in such form and containing within it the apple received from the mill it is carried between pressure-rollers. Preferably a series of pressure-rollers is employed, and they act, primarily, to express the juice; but they also, and by reason of the pressure exerted by them upon the belt and its contents, serve to drive the belt. After passing the pressure-rollers the belt, by means of a suitable device for that purpose, is opened again into a flat form and the pomace is discharged from the belt. The juice expressed by the action of the rollers is collected beneath the upper part of the belt. Owing to the belt being an endless one, the operation of grinding and pressing the apples or whatever fruit is being treated is rendered continuous, all substantially as is hereinafter set forth and claimed, aided by the annexed drawings, making part of this specification and exhibiting the most desirable mode of carrying out the improvement, and in which—

Figure 1 is a vertical longitudinal section of the improved mill; Fig. 2, a plan of the same, the mill being omitted; and Figs. 3, 4, 5, and 6, details upon an enlarged scale, Fig. 3 being a side elevation of one of the pedestals for holding the bearings for a pair of the pressure-rollers, Fig. 4 a horizontal section on the line 4 4 of Fig. 3, Fig. 5 a side elevation of the roller-driving gear, and Fig. 6 an end elevation of the rollers, their bearings, and driving-gear.

The same letters of reference denote the same parts.

A, Fig. 1, represents the mill. As the working of the improvement is not dependent upon any special grinding mechanism, the mill exhibited in the drawings is shown in

outline only; but it is suitably arranged, substantially as shown, to enable the ground apple B to be discharged therefrom onto the belt C. To this end the mill may be sustained in position by any suitable supports. (Not shown.) The belt is composed of suitable material for carrying ground apple and holding it while being pressed. In width the belt is wide enough to receive the apple from the mill and afterward to be folded into a tubular form around the apple, and the belt is preferably an endless one and sustained and carried upon and around suitable bearings—such as the rollers d d' d^2 d^3 of the frame-work D—as well as over the trough E and between the pressure-rollers F F', G G', H H', I I', and J J'. The frame-work is of any proper form and material for the purpose in question. A desirable form is exhibited. The trough E, which is the preferable form of support of the belt beneath the mill, is supported upon the frame-work beneath the mill. The belt passes over the trough, and it may be held closely down thereupon by means of a roller K, which in turn is held in position by means, say, of the arms k k , extending from the mill substantially as shown. After passing the mill the belt containing the apple encounters the deflectors L L'. These deflectors serve, and to that end are properly shaped, to respectively uplift the side portions c c of the belt and fold them successively upon the apple carried upon the central portion of the belt, and so that the folds c c lap upon each other, substantially as shown. The belt in this manner is converted into a tube, and in such form it and its contents are carried between the upper and lower rollers of the series of pressure-rollers. The rollers constitute the pressing mechanism of the construction. The first pair F F' of rollers serve to initiate the pressure, and the rollers of this pair in practice stand the farthest apart from each other. The next pair G G' maintain the pressure and they stand somewhat closer together. The third pair H H' are still closer together, and so on throughout the series.

I desire not to be restricted to a series of any fixed number of pairs of rolls. A single pair even enables the improvement to be car-

ried out in a measure. To enable the rollers in each pair to exert the proper pressure, I preferably make the bearing f of the lower roller a fixed one and the bearing f' of the upper roller a movable one, and obtain the pressure by weighting the upper roller, or, what is the equivalent, employ springs such as shown substantially at M, which exert a downward pressure upon the bearings of the upper roll of each pair. By this means not only is the pressure obtained, but in such a manner as to provide for the passage of any unyielding substances which may accidentally become mixed with the apple, and which, if the rolls do not yield thereto, cause trouble. When a series of pressure-rollers are used as shown, the springs in the successive pairs are respectively suitably contrived to exert greater pressures upon the folded belt and contents. As the belt passes the pressure-rollers the juice is expressed from the apple and discharged through the meshes of the belt, and is collected in a suitable tank N, arranged beneath the upper part of the belt and suitably supported in the frame-work of the machine and provided with an outlet n , through which the juice collected in the tank can be ultimately delivered. The belt in its continued movement is now unfolded into a flat form again, the pomace discharged therefrom, and the belt carried around and around, receiving the discharge from the mill, carrying it past the pressure-rollers, then opening and discharging the pressed pomace, and then returning to beneath the mill again. The means for opening the folded belt and spreading it into a flat form are preferably as follows: O represents what might be termed a "wedge." It is pointed toward the oncoming folded belt, and its point o is always within the folds $c c$ of the belt. The wedge widens backward to the width, or thereabout, of the belt when opened out. It is also crowned to facilitate its action upon the belt, and it is also otherwise shaped and arranged, all so as to provide for the passage of the pomace beneath it to the point at which the pomace is discharged from the belt. This point is preferably at the bend where the belt passes over the roller d' . This roller d' is supported in any suitable manner—as, for instance, upon the brackets $d^4 d^4$, which project from the frame-work D, as shown. The wedge O may be supported in position by arms $o' o'$, which extend upward from the brackets $d^4 d^4$. The lower portion of the belt, for the purpose of cleaning the belt, may be carried past a suitable cleaning device P. This device may consist of an upper roller p and a lower brush p' , or of any other appliance adapted for cleaning the belt.

Various means may be employed for driving the belt, and I desire not to be limited to any special means. What I consider a desirable method is shown in the drawings. The

various shafts f^2, g^2, h^2, i^2 , and j^2 of both the upper and the lower pressure-rollers are provided, respectively, with gears f^3, g^3, h^3, i^3 , and j^3 . These gears engage with worms, such as shown at q upon the shaft Q. This shaft is provided also with a beveled gear q' , which engages with a beveled gear r upon the driving-shaft R. By this means the motion of the driving-shaft is communicated to the pressure-rollers. Owing to the pressure exerted, as described, by the upper pressure-rollers thereupon, the folded belt and contents are nipped sufficiently between the upper and lower pressure-rollers to cause the motion of the pressure-rollers to be communicated to the belt, which is thereby moved, as described. The upper shafts of each pair $f^2 f^2, g^2 g^2$, &c., of shafts are jointed, substantially as shown at $f^4 f^4$, Fig. 6, to enable the upper rollers to rise and fall, according to the thickness of the intermediate belt and contents. The upper roller-shafts can also move endwise sufficiently to accommodate the level of the rollers. I desire also not to be confined to the trough E for supporting the belt beneath the mill, as other supports variously formed will to a greater or lesser degree answer my purpose. I prefer, however, the trough as shown. It serves to support the apple and also to hold and transfer whatever juice may gather in it into the tank beneath the pressure-rollers. It also, by reason of its shape at its sides and receiving end, is favorable, in connection with the roller K, to the changing of the belt from a flat into a folded form, as described. It is desirable to support the belt at intermediate points occurring between the trough and the first pair of pressure-rollers, and also between the various pairs of pressure-rollers, upon some open-work support, and such support is conveniently formed by means of the slats T, substantially as shown.

I claim—

1. The combination of the trough having upwardly-flared sides and tapering longitudinally toward the delivery end of the machine, the traveling belt and the roller arranged just behind the discharge-spout for the material upon the belt, the deflectors with rollers for effecting the conversion of the belt into a tubular form, and means for spreading the belt at the delivery end, substantially as set forth.

2. The combination of the trough having upwardly-flared sides and tapering longitudinally toward the delivery end of the machine, the traveling belt, the roller arranged just behind the discharge-spout for the material upon the belt, the deflectors with rollers for the conversion of the belt into a tubular form, and the deflectors for spreading the belt at its delivery end, substantially as set forth.

3. The combination of the trough, the traveling belt, the rollers, and the deflectors, two adapted to lap and convert the belt into a tube

and one wedge-shaped to spread said tube or
belt at its delivery end, said rollers being ar-
ranged intermediately of said deflectors and
bearing on said tube or belt, substantially as
5 set forth.

4. The combination of the mill, the trough,
the traveling belt, the rollers, and the deflect-
ors, two adapted to lap and convert the belt
into a tube and one being wedge-shaped to
10 spread or open said tube and permit the pom-

ace to pass beneath it, substantially as de-
scribed.

Witness my hand this 30th day of Decem-
ber, 1890.

JACOB L. ROHRER.

Witnesses:

JULIUS E. STUHLMAN,
FRED W. STUHLMAN,
JOHN W. BENTWARE.