

Oct. 24, 1944.

L. MORONI

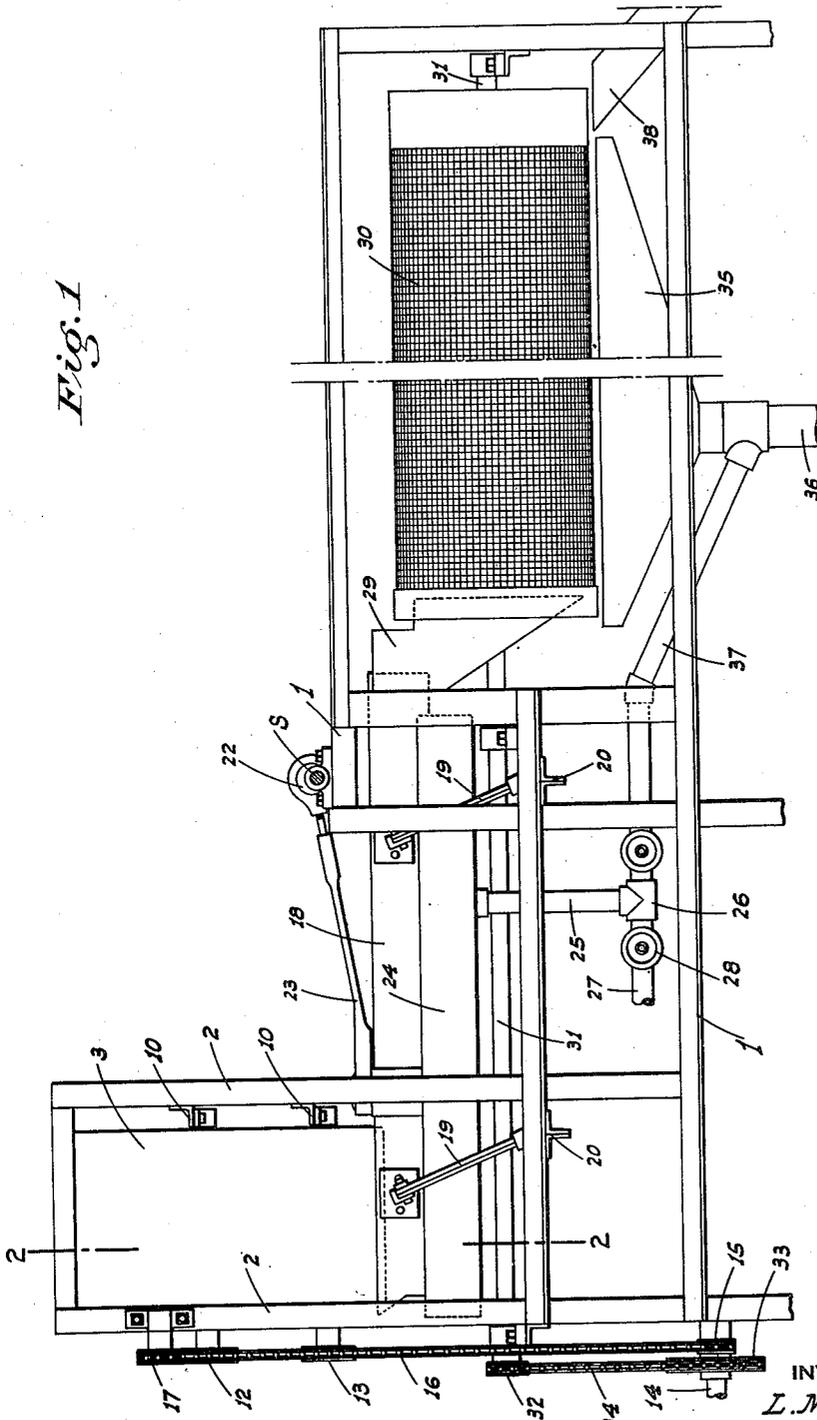
2,360,964

JUICE SEPARATOR

Original Filed Oct. 3, 1941

3 Sheets-Sheet 1

Fig. 1



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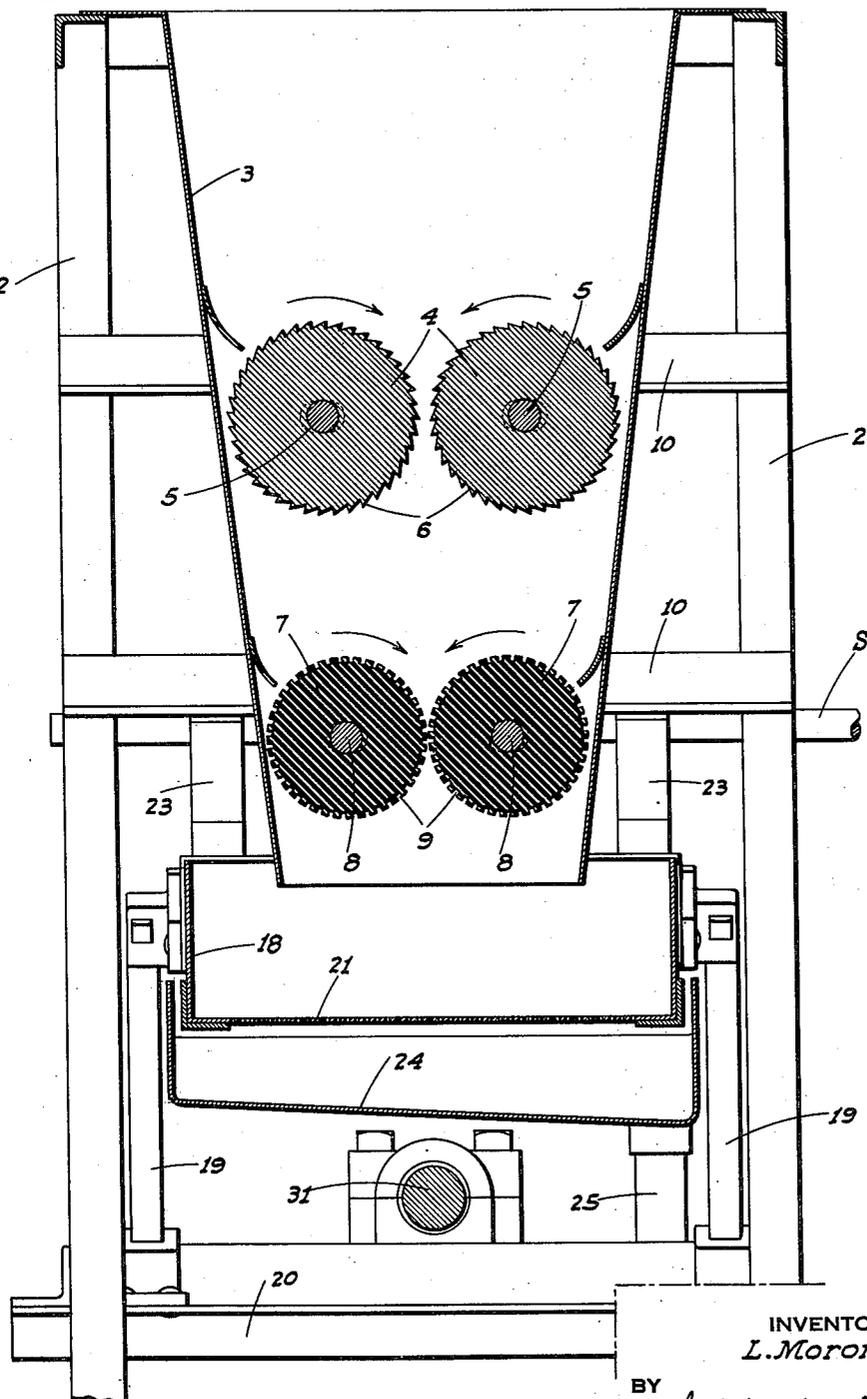
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JUICE SEPARATOR

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Fig. 2



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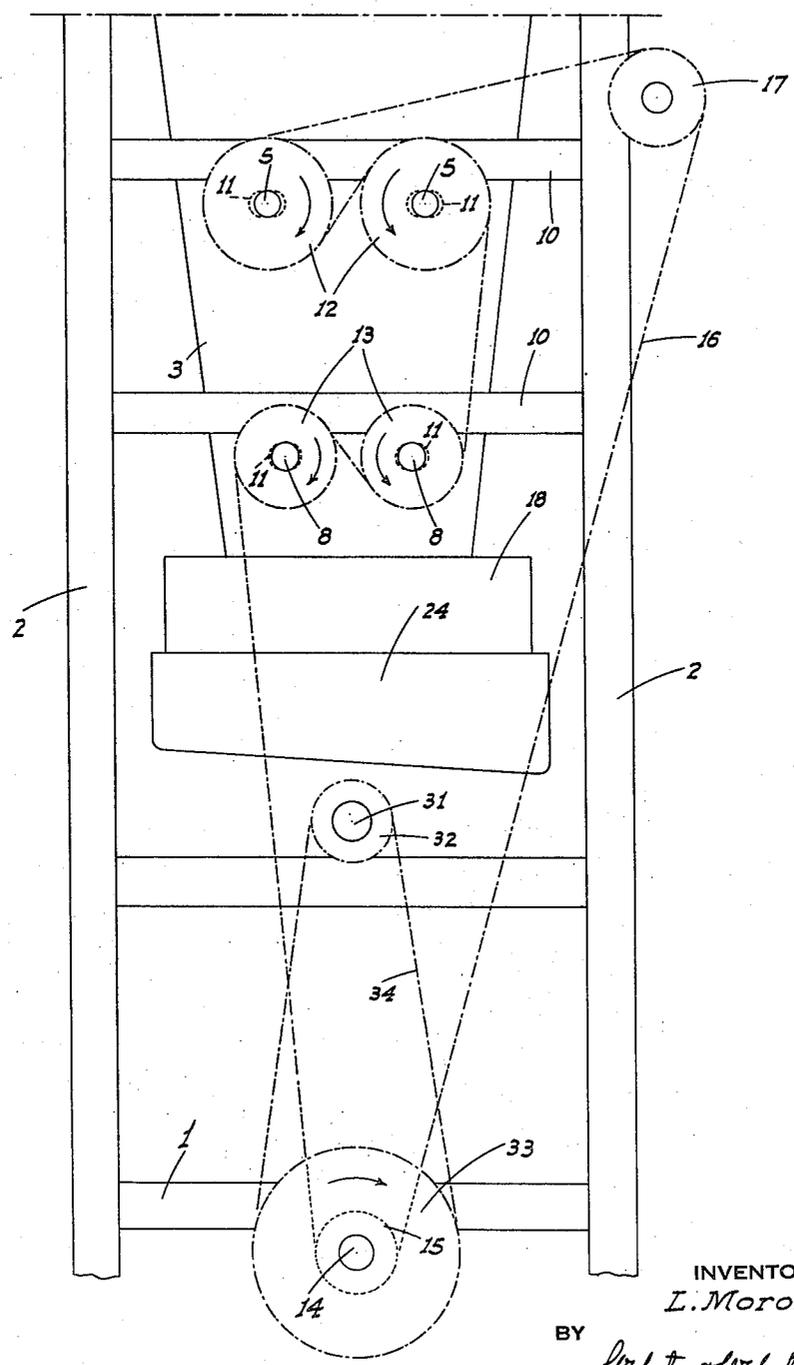
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3 Sheets-Sheet 3

*Fig. 3*



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# UNITED STATES PATENT OFFICE

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## JUICE SEPARATOR

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Substituted for abandoned application Serial No. 413,419, October 3, 1941. This application April 26, 1944, Serial No. 532,720

8 Claims. (Cl. 146—76)

This invention relates in general to an improvement in winery equipment, and in particular the invention is directed to unique apparatus for separating different grades of juice from grapes.

As is well known in the wine-making industry, initial mild crushing and pressing of wine grapes produces a clear unadulterated juice which is requisite for the manufacture of champagne, this mild crushing and pressing avoiding the rupturing of those inner cells of the grapes which carry the colored juice undesirable for champagne, but which is used for common wines. In addition, with this mild action the grape stems remain intact and the acid therefrom does not escape into the clear juice, as would occur if said stems were detached or mashed.

This application is a substitute for abandoned application, Serial No. 413,419, filed October 3, 1941.

The old practice to obtain the clear juice for champagne was to place the grapes in a wine press and then slowly apply an easy pressing action. The clear juice was then drawn off, and subsequently the forceful pressing action was applied to obtain the colored juice as used for the common types of wine. However, this practice was slow, tedious and not well adapted to large-scale production.

It is therefore the principal object of this invention to provide a novel power driven juice separator which is operative to effect, as a continuous process, a separation from grapes of the clear unadulterated juice intended for the manufacture of champagne.

A further object of the invention is to provide apparatus, as above, which is designed to assure against separating or mashing of the grape stems, and to thus prevent acid from said stems entering the clear juice being produced.

An additional object of the invention is to provide a juice separator of the type described which includes a unique assembly of crushing rolls.

It is also an object of the invention to provide a unique method of separating from grapes the clear juice desired for the manufacture of champagne.

A further object of the invention is to produce a simple and inexpensive device, and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a side elevation of the improved juice separator.

Figure 2 is an enlarged cross section taken on line 2—2 of Figure 1.

Figure 3 is a diagrammatic end view showing the preferred form of drive for the crushing rolls.

Referring now more particularly to the characters of reference on the drawings, the juice separator comprises a rigid, elongated and horizontally extending frame, indicated generally at 1, having transversely spaced sides; a substantial portion of the apparatus being mounted between said sides, as hereinafter described.

At one end the frame includes a plurality of upstanding corner posts 2, which form in effect a tower extending above the horizontal plane of the frame 1; such tower having a relatively tall hopper 3 rigidly suspended therein, two sides of said hopper being parallel, as shown. A pair of metallic rolls 4 are disposed in the hopper substantially centrally between the upper and lower ends of the latter, such rolls being carried on horizontal shafts 5 which are disposed lengthwise of the elongated frame 1. The rolls 4 are formed at the periphery with teeth 6 which extend the full length of the rolls and face in the direction of rotation; the rolls 4 rotating in opposite directions and so that the upper peripheries thereof move in approaching relation.

Below the rolls 4 is another pair of rolls 7, these rolls being of very soft, resilient rubber, and of somewhat lesser diameter than the rolls 4. The rolls 7 are supported by shafts 8 which are parallel to the shafts 5. The rolls 7 have longitudinally extending slots 9 formed therein about their entire periphery, these slots being closely spaced circumferentially.

The outer end portions of the shafts 5 and 8 project through the adjacent sides of the hopper 3 and are suitably journaled and supported in connection with cross members 10 which extend between corresponding corner posts 2; the shafts of each pair of rolls being journaled for adjustment in a direction to and from each other, and as indicated diagrammatically and by dotted lines at 11 in Figs. 2 and 3.

In normal operation the upper rolls 4 are spaced apart slightly at their peripheries, while the soft rubber lower rolls 7 are substantially in peripheral contact.

The shafts 5 and 8 extend axially some distance beyond the adjacent end of the frame 1

and are fitted with sprockets 12 and 13 respectively. A horizontal drive shaft 14 is journaled on the frame 1 below sprockets 13, and this drive shaft is fitted with drive sprocket 15. An endless chain 16 extends from sprocket 15 upward about sprockets 13 in reverse drive relation, thence extends over an idler sprocket 17 mounted on one of the corner posts 2, and from there extends back to the drive sprocket 15.

A substantially horizontal shaker table 18 is disposed lengthwise between the sides of frame 1 adjacent the top of the latter and with one of its ends disposed in receiving position below the lower and discharge end of hopper 3. This shaker table is supported on both sides by longitudinally spaced resilient supporting members 19, the lower ends of which are mounted in connection with cross members 20 of the frame. The shaker table 18 is formed with a finely perforated bottom plate 21. The shaker table is actuated by eccentric units 22 mounted atop the frame 1 and having connecting rods 23 secured at their outer end to the shaker table. The eccentric units 22 are actuated by a shaft S driven in any suitable manner. A catch or drain pan 24 is mounted within the frame 1 below the shaker table 21, said pan sloping toward one side and having an outlet conduit 25 depending from the low point, such conduit having a T-fitting 26 at its lower end. A carry-off pipe 27 is connected with said fitting, and has a valve 28 interposed therein. At the end remote from hopper 3, the shaker table 18 feeds into a chute 29 which in turn discharges into the adjacent end of a rotary, screen type mesh stemming unit 30 which is of conventional construction; such unit 30 having the drum portion mounted on a substantially horizontal shaft 31 journaled lengthwise in frame 1 in suitable manner. The shaft 31 extends the full length of frame 1 below the shaker table to a termination beyond the endless chain 16, being there provided with a sprocket 32 driven from a large diameter sprocket 33 on drive shaft 14 by means of an endless chain 34.

Another catch pan 35 is mounted in frame 1 below the mash stemming unit 30, and a discharge pipe 36 leads downward from the low point of such catch pan 35. Juice from catch pan 24, if not needed for separate use, may be bypassed into discharge pipe 36 by means of a normally closed valved pipe 37 which extends from fitting 26 to pipe 36. A discharge chute 38 is mounted in receiving relation to the outer and discharge end of the drum of unit 30 to receive the grape stems.

In operation, bunches of grapes are placed in hopper 3 whereupon they are at once engaged by the upper rolls 4 which effect; first, a disintegration of the bunches into separate grapes; and, secondly, an initial rupturing of the skin of said separate grapes. The grapes then fall below rolls 4 and are engaged by the very soft rubber rolls 7, which effect a mild crushing action which does not break down the center portion of the grapes. In the above manner the outer portion of the flesh of the grapes, and which carries the clear juice, is effectively macerated without any mashing of the relatively hard stems or the interior of the grapes. From rolls 7 the partially crushed grapes fall onto shaker table 18, the action of such table being forceful and causing a release of the clear juice which filters through the perforate bottom plate 21 of such table into catch pan 24 and thence into conduit 25. The balance of the crushed grapes—then in the form

of mash—passes off the discharge end of the shaker table, down chute 29 into the rotary stemming unit 30. The action of this unit effects a clean separation of the stems from the mash; the mash passing through the screen of the unit, and the stems still in unbroken or uncrushed form being fed out of the ends of such unit into chute 38. The mash from rotary unit 30 is received in catch pan 35, whence it is carried through pipe 36 for further processing.

The juice which is caught in pan 24 is clear and unadulterated, and is that which is used for the manufacture of champagne, whereas the mash—with its included colored juice—which is received in catch pan 35, is that which is employed to manufacture the more common types of wine.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. A juice separator for grapes, comprising a hopper, a pair of driven parallel rolls between which the hopper feeds from above, said rolls turning toward each other at the top and being adjusted to only partially crush grapes passing therebetween, a shaker table into which the rolls discharge, said shaker table having a perforate bottom, the perforations being of a size only for the filtering of juice draining from the partially crushed grapes on the table, a rotary mash stemming unit mounted beyond the shaker table and into which said table discharges, and a catch pan mounted below said unit.

2. A juice separator for grapes, comprising a pair of driven, substantially parallel rolls disposed in adjacent relation, means to feed grapes between said rolls from above, the rolls turning toward each other at the top, another pair of similarly disposed rolls mounted beneath said first named pair for rotation in the same direction, the rolls of the first named pair being of rigid material, the rolls of each pair being disposed in such relation to each other to only partially crush grapes passing therebetween, and longitudinal teeth on the periphery of the rolls of the first pair facing in the direction of rotation, the periphery of the rolls of said other pair having longitudinal grooves cut thereinto in closely spaced circumferential relation.

3. A juice separator for grapes, comprising a frame, a hopper mounted on the frame, means in the hopper to separate grapes from a bunch, other means in the hopper to partially crush the separated grapes, a shaker table mounted on the frame below the hopper and into which the latter discharges, said table having a finely perforate bottom, a catch pan below said table, a rotary mash stemmer mounted on the frame and into which stemmer the shaker table discharges, and another catch pan below said stemmer.

4. A separator as in claim 3, with a drain pipe from the first named pan, another drain pipe from said other pan, and a controlled bypass conduit between the pipes.

5. A device as in claim 2 in which the toothed rolls are spaced apart a short distance and the

grooved rolls are substantially in peripheral engagement.

6. A juice separator for grapes, including a pair of driven rolls disposed in adjacent parallel relation, said rolls turning toward each other at the top and having teeth on the periphery thereof facing in the direction of rotation, and another pair of rolls mounted below said first pair for rotation in a like direction, said other pair having a periphery of soft material longitudinally grooved in closely spaced circumferential relation; the toothed rolls being spaced apart a short distance whereby to separate grapes from bunches and to rupture the skin of said separate grapes, and the grooved rolls being substantially in peripheral engagement whereby to partially crush said separate grapes after rupturing of the skin of the latter.

7. A juice separator for grapes, comprising means to separate grapes from a bunch, means to partially crush the separated grapes, an agitating mechanism into which the partially crushed grapes are fed whereby to release juice

therefrom, said mechanism having a finely perforate bottom through which said juice can filter, juice catching means below said bottom, a power driven stemmer mounted adjacent said agitating mechanism and into which stemmer said mechanism discharges, and mash catching means below said stemmer.

8. A juice separator for grapes, comprising a frame, a hopper mounted on the frame, means in the hopper operative to separate grapes from bunches and to rupture the skin of said separate grapes without substantially crushing the latter, other means in the hopper below said first named means operative to only mildly and partially crush said separate and skin-ruptured grapes, a shaker table mounted on the frame below the hopper and into which the latter discharges, said table having a finely perforate bottom through which only the juice released from said partially crushed grapes can filter, and catch means below said shaker table.

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