

Aug. 6, 1940.

W. STONER

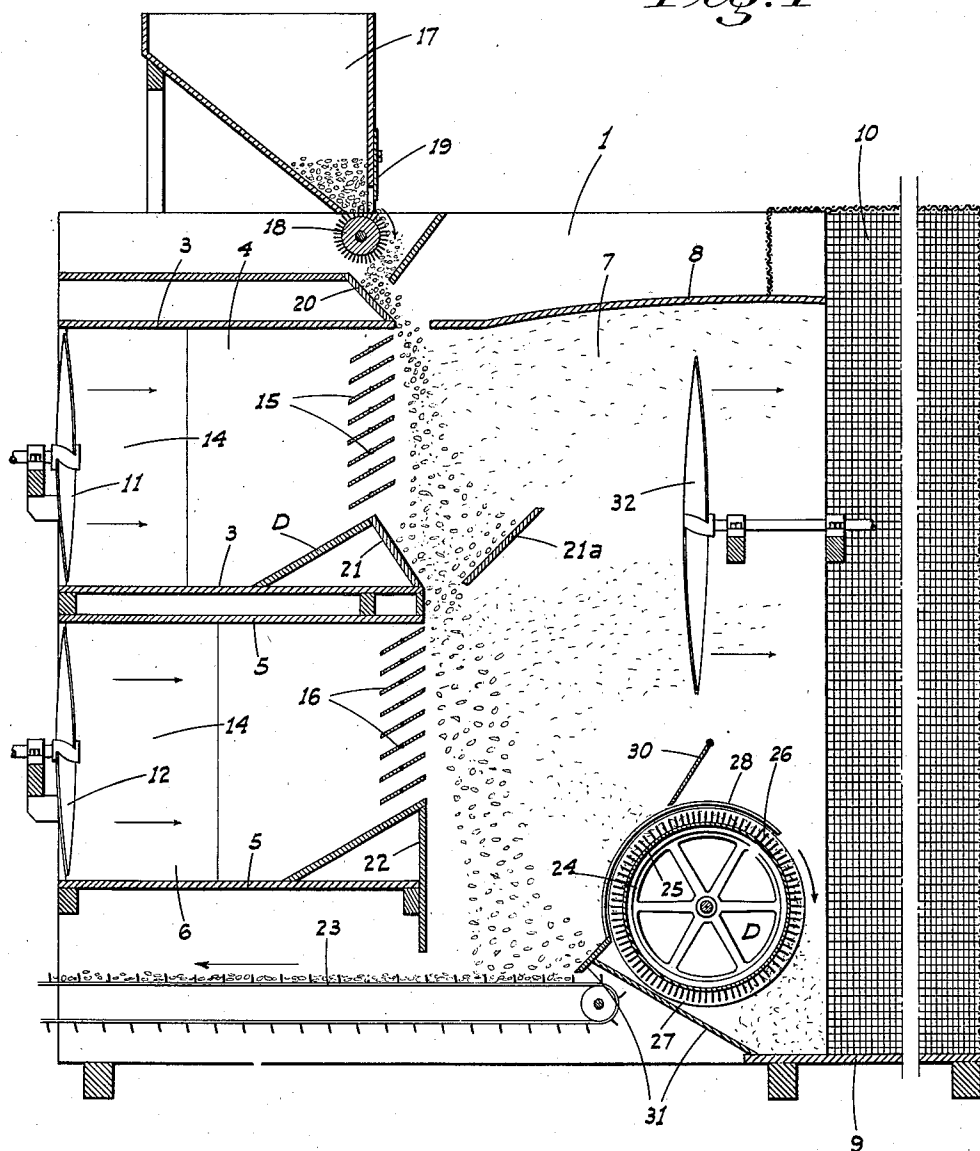
2,210,103

MATERIAL SEPARATOR

Filed May 10, 1937

2 Sheets-Sheet 1

Fig. 1



INVENTOR

Win. Stoner

BY *Samuel J. White*
ATTORNEY

Aug. 6, 1940.

W. STONER

2,210,103

MATERIAL SEPARATOR

Filed May 10, 1937

2 Sheets-Sheet 2

Fig. 2

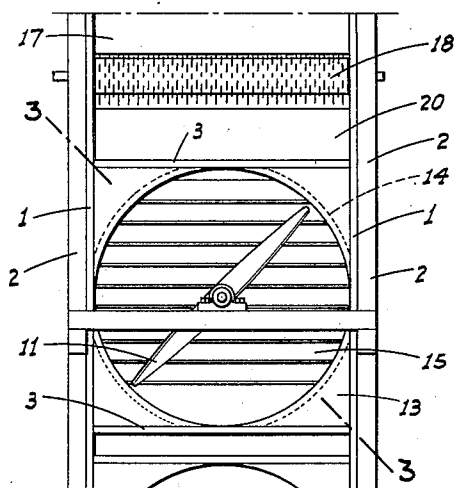


Fig. 3

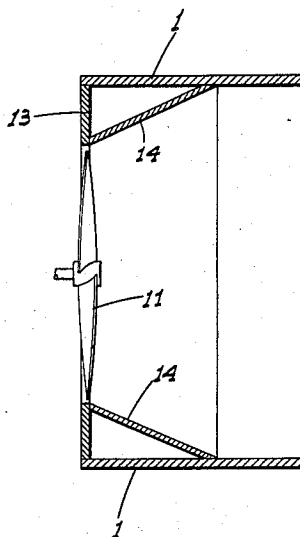


Fig. 4

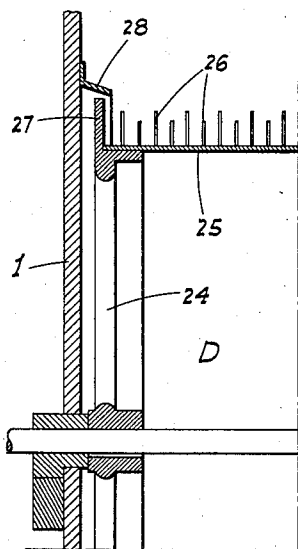
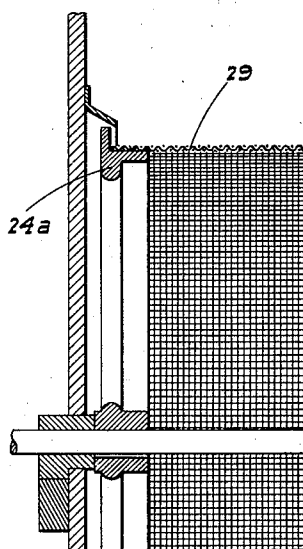


Fig. 5



INVENTOR

Wm. Stoner

BY

Campbell

ATTORNEY

UNITED STATES PATENT OFFICE

2,210,103

MATERIAL SEPARATOR

William Stoner, Fresno, Calif.

Application May 10, 1937, Serial No. 141,666

3 Claims. (Cl. 209—12)

This invention relates to material separators, particularly to one for separating raisins from the stems mingled therewith after they have passed through the stemmer, and represents improvements and modifications over the structure for this purpose shown in my copending application for patent, Serial No. 91,871, filed July 22, 1936.

The main objects of the present invention are to provide for a better control of the feeding of the raisins to the separator in a continuous stream, a more positive segregation of the stems from the raisins and a better concentration of the separated stems so that they are more readily disposed of and so that they will not become scattered indiscriminately in the vicinity of the separator.

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 sectional elevation of my improved separator.

Figure 2 is a fragmentary front end view of the same.

Figure 3 is a fragmentary diagonal section on the line 3—3 of Fig. 2.

Figure 4 is a fragmentary section of the stem catching and conveying drum.

Figure 5 is a similar view of a modified form of the drum.

Referring now more particularly to the characters of reference on the drawings, the apparatus comprises transversely spaced side walls of considerable height and length, suitably supported by a frame work which includes uprights 2. Extending between the walls 1 and projecting lengthwise thereof a certain distance from their front end are vertically spaced walls 3 forming a square wind tunnel 4 with the adjacent portion of said walls 1. Similarly disposed walls 5 are mounted below the tunnel 4 and form another square wind tunnel 6 with the adjacent portion of the side walls. The entire space between the walls 1 beyond the tunnels forms a single chamber 7. At the top this chamber is enclosed by a convexly curved extension 8 of the upper tunnel wall 3, on the bottom by a flooring

9 below the lower tunnel, and at the rear end by a somewhat fine mesh screen enclosure 10 which preferably projects some distance beyond the walls 1. In the forward end of the tunnels 4 and 6 are rotary air impellers 11 and 12 respectively set on a horizontal axis, and of a suitable high velocity type such as airplane propellers. Each impeller is surrounded by an end-wall 13 mounted at the front end of the corresponding tunnel and which is provided with a circular opening about and concentric with the impeller as shown in Fig. 2. The corner areas in the tunnels from and for some distance beyond the end walls are eliminated by the provision of fillers 14 which diverge to a relatively smooth junction with the walls of the tunnels as shown in Fig. 3. In this manner the formation of eddy currents otherwise set up by the rotation of the impellers is avoided.

Adjacent the rear end of the tunnels 4 and 6, some distance beyond the impellers, a series of vertically spaced air deflecting louvers 15 and 16 respectively are arranged across the tunnels. These louvers are disposed with an upward slope to the rear and are preferably pivotally mounted for adjustment to alter the slope as in the previous structure. The louvers 16 are set a short distance beyond the louvers 15 as shown in Fig. 1.

Disposed above and mounted in fixed connection with the walls 1 at the top thereof and above the tunnel 4 is a supply hopper 17, the flow from which is controlled by a rotary feed wheel 18 of suitable form. The top of this wheel turns toward the rear and the volumetric flow from the hopper with a constant speed of the wheel is governed by a vertically sliding gate 19 mounted on the back wall of the hopper.

The raisins from the feed wheel are discharged into a guide chute or hopper 20 which delivers into the chamber 7 at the rear end of the tunnel 4, just beyond the louvers 15. At the bottom of the series of louvers 15, which terminate some distance above the bottom of the tunnel 4, is a downwardly and rearwardly sloping deflector 21 which extends to the top wall of the tunnel 6 and serves to catch and feed the raisins falling thereon into the chamber 7 just below the louvers 16. This deflector extends from under the lowest louver 15, and joins with a downwardly sloping air deflector D which projects into the tunnel 4. By thus arranging deflector 21 relative to the louvers, there is no likelihood of raisins catching on the air deflector and possibly being diverted into the tunnel. Said deflector 21 forms

the front wall of a hopper, the back wall 21a of which extends between the walls of chamber 7 with an upward slope. At the bottom of the series of louvers 16, a vertical deflector 22 forms the front wall of the raisin discharge hopper which delivers onto a horizontal conveyor 23 of suitable type which extends to the front of the apparatus.

The back of the hopper is formed by the forward side of a rotary stem catching drum D arranged so that said side turns upwardly. In its preferred form, the drum comprises connected end spiders 24 supporting a solid drum band 25 from which stiff wire pins 26 project outwardly in somewhat closely spaced relation. The drum extends practically the full width between the walls 1 as do all the louvers, hoppers, etc. To prevent the raisins from possibly dropping between said walls and the adjacent ends of the drum, the latter is provided with flanges 27 at its ends projecting outwardly of the pins and the upper portion and front of which flanges are overlapped by deflector bands 28 secured on the walls 1.

If a cheaper form of drum is desired, the pins and the solid band are eliminated and are replaced by a drum surface of wire screening 29 which is secured to the end spiders 24a as shown in Fig. 5. In either case an adjustable deflector 30 projects upwardly in the chamber 7 from adjacent the top of the drum, and other baffle or deflector elements 31 are provided at the bottom of the drum to keep the raisins from falling between the drum and conveyor, and the stems caught by the drum from possibly falling onto the conveyor.

In operation the raisins fall by gravity from the hopper 20 into the chamber 7 in the form of an even stream across the full width thereof. Here they are at once subjected to the air blast from the impellor 11 passing between the louvers 15 which direct the blast upwardly. Since the stems of the raisins are lighter than the raisins themselves, they are carried out of the raisin stream in an upward direction. Said stems then slide along the curved roof 8 of the chamber 7 until the force of the blast is expended. They then drop toward the bottom of the chamber, those falling nearest the raisin discharge hopper being eventually caught by the drum D and removed from adjacent said hopper and deposited clear of the raisins and conveyor 23 onto the floor 9. If desired, a suction fan 32 may be mounted in the upper portion of the chamber 7 to further act on the stems and draw them into the screen enclosure 10. If desired the chamber 7 may be widened in the zone of the fan to accommodate a fan of greater diameter than the width of the tunnels. The purpose of the screen enclosure is to permit of the necessary free escape of the air currents set up by the impellers and fan, without allowing the stems to escape. The latter are thus all retained within the enclosure from which they may be removed whenever desired.

The raisins continuing to fall are again con-

finer as a narrow stream as they pass through the hopper formed by elements 21 and 21a, and become acted on by the blast passing between the lower louvers 16. This second blast blows out any remaining stems which may be mingled with the raisins. The raisins then drop through the lower hopper and are received by the conveyor 23.

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 raisin and stem separator comprising upper and lower air tunnels, an enclosure as deep as both tunnels connected to and extending from the tunnels at their inner end, a feed-in hopper having a restricted mouth delivering into the enclosure at the top of and adjacent the inner end of the upper tunnel, another hopper in the enclosure at the top of and adjacent the inner end of the lower tunnel to receive the raisins dropping from the upper hopper and also having a restricted mouth, there being an unrestricted space horizontally between the upper tunnel and the enclosure therebeyond above the lower hopper, means to set up separate air blasts through the tunnels below both hoppers in the direction of the enclosure, and a suction fan in the enclosure beyond the hoppers positioned and adapted to set up horizontal air currents under both hoppers and drawing away from the tunnels.

2. In a raisin separator, an enclosure of substantial height, means to drop raisins and their stems into said enclosure, a transversely extending hopper in the bottom of said enclosure into which said dropping raisins pass, a substantially horizontal air conduit extending for a substantial distance above said hopper, means for producing a current of air through said conduit and through the dropping raisins and stems, the back side of said hopper comprising a rotary drum whose circumferential surface is formed of wire screening and whose hopper side moves upwardly.

3. In a raisin separator, an enclosure of substantial height, means to drop raisins and their stems into said enclosure, a transversely extending hopper in the bottom of said enclosure into which said dropping raisins pass, a substantially horizontal air conduit extending for a substantial distance above said hopper, means for producing a current of air through said conduit and through the dropping raisins and stems, the back side of said hopper comprising a rotary drum having a circumferential stem catching surface and whose hopper side moves upwardly.

WILLIAM STONER.