

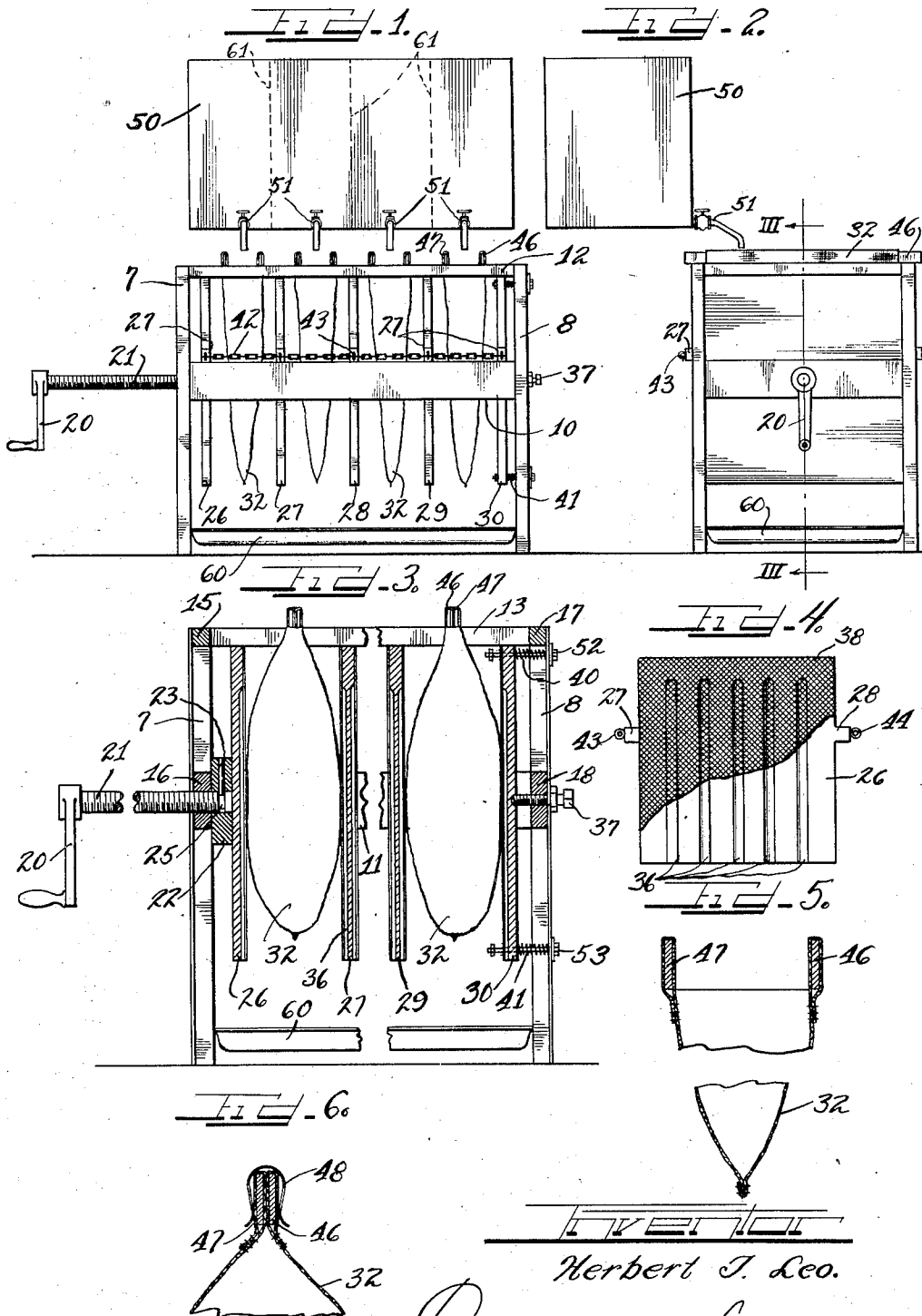
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PRESS AND FILTER

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PRESS AND FILTER

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3 Claims. (Cl. 100—44)

My invention relates to a combined press and filter adapted for use in removing pectinous material from fruits.

Pectin occurs in the rinds of many varieties of fruits, particularly citrus fruits, and various methods have been proposed for its extraction from these sources. I have now devised a new process and apparatus for use therewith which makes possible a more efficient extraction of pectin from fruit rinds at remarkably low cost and with a high degree of efficiency.

Particularly the new apparatus devised by me comprises a combined fruit press and filter which is adapted for use in connection with my new process.

It is, then, an object of my invention to provide a cheap and efficient process for extracting pectin from natural sources such as fruit rinds.

It is a further object of this invention to provide a combination press and filter for use in connection with the above process.

Other and further objects of this invention will be evident from the following specification and the accompanying claims.

Figure 1 is a side elevational view of my combination press and filter.

Figure 2 is an end elevational view of the apparatus shown in Fig. 1.

Figure 3 is a sectional view taken along the line III—III of Fig. 2, with parts shown in elevation.

Figure 4 is a plan view of one of the pressure plates forming a part of my apparatus, with parts broken away.

Figure 5 is a fragmentary sectional view of one of the bags used in my apparatus.

Figure 6 is a fragmentary sectional view of one of my bags showing the top in closed position and secured by a clamp.

The reference numeral 7 represents an end portion of a frame supporting the various parts of my apparatus. The end portion 7 is connected to another end portion 8 by bars 10, 11, 12 and 13. The end portions 7 and 8 each have cross-portions 15, 16, 17 and 18. A crank 20 is attached to a screw 21 which threadedly engages bar 16 and which carries a head 22 which is rotatably attached to the screw 21 by means of the pin 23 which engages groove 25 of screw 21.

The head 22 rests against one surface of a movable end board 26, a plan view of which is shown in Fig. 4. This board 26 is supported on bars 10 and 11 by means of ears 27 and 28 which rest upon the upper edge of said bars. A plurality of

similar boards 27, 28, 29 and 30 are also provided and supported in a manner similar to 26.

These press boards or separators are for the purpose of separating a series of filter bags 32 which holds the material being pressed and filtered. Preferably, the sides of said boards which contact the bags have grooves 36 which permit the liquid expressed from said bags to flow out from between the bags and the plates. A screen 38 is placed over the grooves to prevent the said bags from being pressed into the grooves 36 and preventing proper drainage of the liquid material therethrough.

The end plate 30 has a special adjustment permitting it to tilt sufficiently to take up any unevenness in the filling of the bags. This plate is pivoted on a set screw 37 and when no force is applied by means of the screw 21 the plate tends to assume a vertical position by reason of pressure exerted by the springs 40 and 41 which are held in place by bolts 52 and 53. However when any pressure is applied by means of screw 21 the plate will tilt either way to equalize any unevenness in the pressure.

The extensions 27 and 28 of each of the boards 26 to 30 are attached together by the chain 42 as shown in Fig. 1, screw eyes 43 and 44 being provided in each plate for this purpose. A duplicate chain occurs on the opposite side of the press (not shown). These chains facilitate the replacing of the plates in their original position after each pressing operation, since it is only necessary to move plate 26 back to its initial position, as shown, in order to properly space all of the plates. If desired the head 22 may be attached to the plate 26 in which case it is only necessary to back up the screw 21 in order to return all parts to their original position.

The bags 32 are constructed from a suitable filter fabric and are supported by two bars 45 and 47 which when the bag is closed, are held tightly together by the clamp 48 to prevent any leakage from the bag when pressure is applied.

The material to be pressed and filtered is supplied from the tank 50 which is divided by partitions 61 into a number of equally spaced compartments which are drained by the series of stop-cocks 51.

In the operation of my process, pectinous material such as rinds of citrus fruit are comminuted to from 5 to 60 mesh (per inch) and then cooked for about ½ hour in a suitable amount of water and kept at a definite predetermined pH value. After this cooking is completed, a quantity of diatomaceous earth or other filter aid may be added

ed and the mass thoroughly mixed to secure uniformity.

It is advantageous to have the pulp sufficiently fine so that the cells will be ruptured during the pressing operation thus securing a high degree of efficiency in recovering the pectin containing juices from the interior thereof. However, a high degree of fineness is not desirable since too much of the pulp will then become colloidal and difficulty will be experienced in filtering. It is also desirable to have the fineness as uniform as possible. A degree of fineness such as given above will be very satisfactory but I do not wish to be understood as limiting myself thereto since, obviously some of the advantages of my invention may be obtained with coarser or finer material than is included within this range.

After the filter aid has been added, or, if none is to be used, then after the cooking step the material is poured into the compartments of the tank 50. Each of these compartments is of the same capacity as one of the bags 32 so that by opening the stopcocks 51 all of the bags may be filled simultaneously. After filling, each bag is closed by a clip 48 after which the pressure is applied by means of the screw 21 whereby the liquid contents of the bags is squeezed out and flows into the removable receptacle 60. The pectin may then be removed from this material by conventional methods.

Thus it will be seen that I have devised a new process for extracting pectin from pectinous materials and a new and very superior combination of a filter and press for use therewith.

I am aware that many changes may be made

and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

I claim as my invention:

1. A combined press and filter comprising a series of dependent porous, flexible bags, a series of vertically disposed, relatively movable press boards alternating therewith, means for applying pressure to a press board at one end of said series, the press board at the other end of said series being pivoted at its central point, and resilient means for holding said last press board in vertical position.

2. A filter press comprising a series of relatively movable press boards and a series of filter bags alternating therewith, means for applying pressure to a press board at one end of said series, the press board at the other end of said series being pivoted at the center thereof to equalize the pressure throughout the working surfaces of the press boards.

3. A filter press comprising a series of filter bags, a series of press boards alternating with said bags, a frame for slidably supporting said bags and press boards, means for applying pressure to a press board at one end of the series, the press board at the other end of the series being pivoted at the center thereof to equalize pressure throughout the working surfaces of the press boards and means for holding said end press board in vertical position.

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