Aug. 16, 1927. 1,638,981

A. COLUMBRO

CONTINUOUS PRESS

Filed March 20, 1926 2 Sheets-Sheet 1

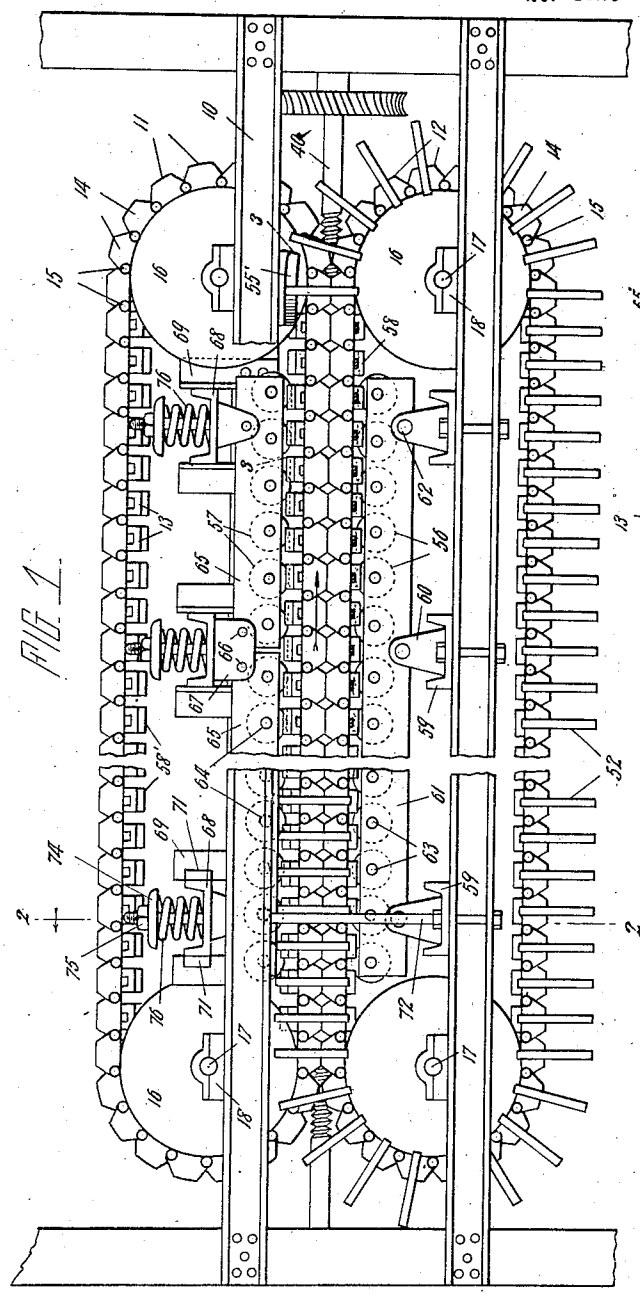


FIG. 1.

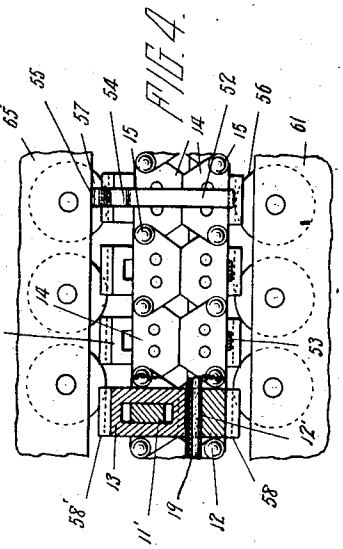


FIG. 4.

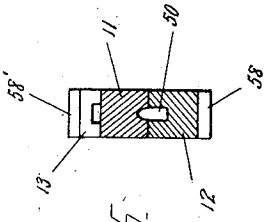


FIG. 5.

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FIG. 2.

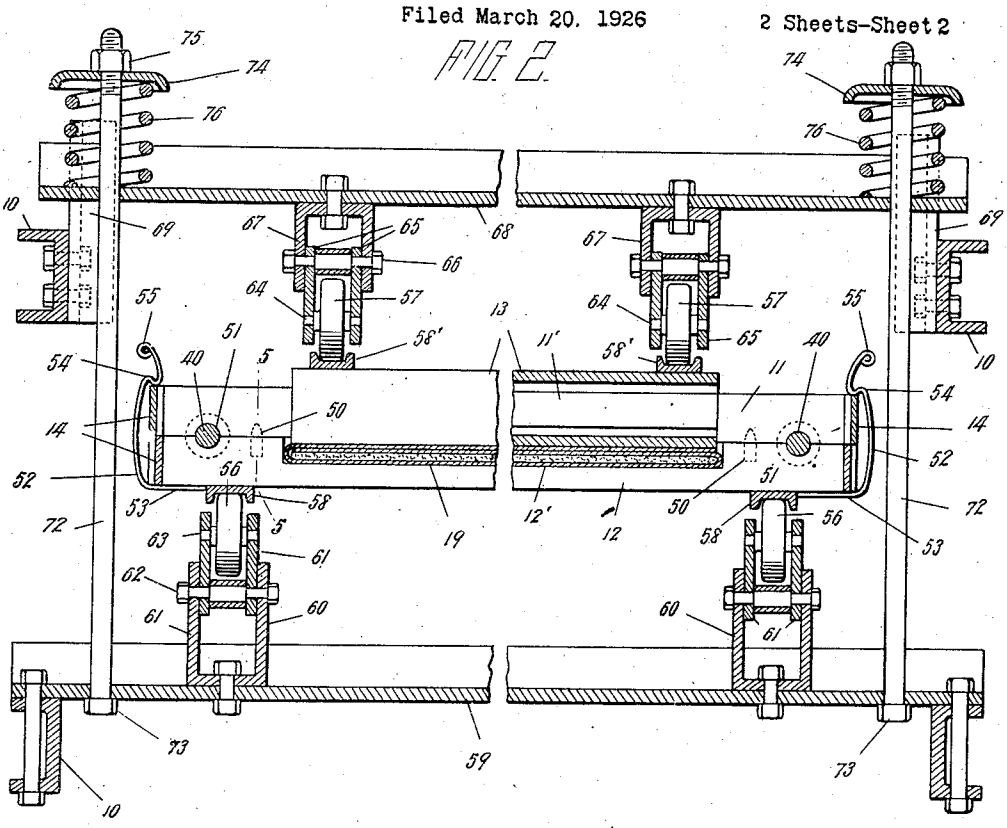
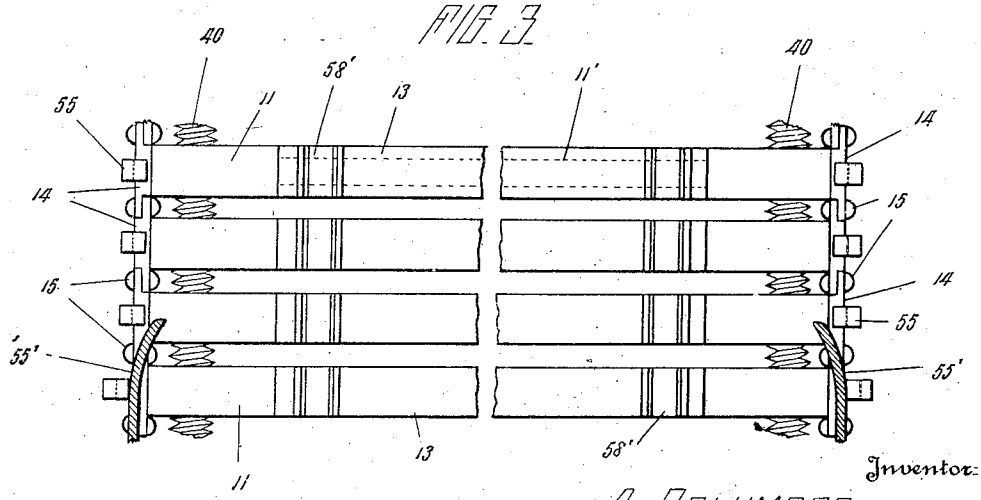


FIG. 3.



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Patented Aug. 16, 1927. 1,638,981

UNITED STATES PATENT OFFICE.

ANGELO COLUMBRO, OF STOCKTON, CALIFORNIA.

CONTINUOUS PRESS.

Application filed March 20, 1926. Serial No. 96,175.

The present invention relates to continuous presses, and is particularly an improvement over the press disclosed in my copending application Serial No. 695,269, filed February 26, 1924 (now Patent No. 1,577,519, issued March 23, 1926).

One object of the invention is the provision of endless chains of novel construction for obtaining pressure between them to compress the material which passes between the chains.

Another object is the provision of endless chains of bars and novel means for actuating them.

A further object is to improve the construction of the chains and actuating means therefor, whereby the machine will be practical and efficient.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts, as hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a fragmentary side elevation of the machine.

Fig. 2 is an enlarged cross section on the line 2—2 of Fig. 1, portions being shown in elevation and portions being broken away.

Fig. 3 is a horizontal section substantially on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged fragmentary side elevation showing the hinge connections of the presser bars, with one pair of bars shown in cross section.

Fig. 5 is a cross section on the line 5—5 of Fig. 2.

The machine, in its general construction and operation, is substantially like that disclosed in said copending application, but only one pair of presser chains is disclosed herein and other parts, not pertinent to the present improvements, are also omitted. The machine is used for expressing juice, liquid or moisture from various materials and products, such as fruit, berries, vegetables, grain, seed, peat, etc., but the machine can be built and used for purposes other than for expressing, such as for compressing materials.

A suitable frame 10 is provided which, as shown, is built of structural iron or steel, in which are mounted the endless presser chains which are superposed. The upper chain is composed of a series of transverse presser bars 11 and the lower chain is composed of a series of transverse presser bars 12. Said bars may be of wood, metal or other suitable material, and may be of different sizes. The bars 12 of the lower chain have recesses 12′ to receive the material that is to be compressed, and the bars 11 of the upper chain have portions 11′ intermediate their ends which are of reduced cross-section substantially coextensive in lenth with the recesses 12′. Clamping sleeves 13 of rectangular cross-section surround the portions 11′ and are slidable thereon toward and away from the bars 12, when the bars 11 and 12 are disposed together at the adjacent runs of the chains. The sleeves 13 are therefore movable into the recesses 12′ for compressing the material which, as more fully disclosed in the aforesaid application, may be surrounded by a sheet or cloth 19.

The bars of each chain are hingedly connected. Thus, end pieces or plates 14 are secured to the ends of the bars of each chain and are overlapped and pivotally connected, as at 15, between the bars, the bars being preferably spaced apart. In this manner, the bars of each set are connected in an endless chain, and said chains of bars pass around wheels 16 at the opposite limits of travel of the chains. Said wheels 16 are mounted on transverse shafts 17 journaled in bearings 18 secured to the frame.

The chains are not driven from the wheels 16, but instead the adjacent presser bars of the two chains are individually advanced, thereby moving the presser bars positively and effectively, without strains on the joints between the bars. The chains are actuated by worms or screws 40 between the two chains and having their terminals journaled in the frame beyond the wheels 16. The end portions of the bars 11 and 12, which bear together snugly, have the screw-threaded recesses or half-nuts 51 to engage the upper and lower portions of the worms, whereby when the bars of the two chains come together they embrace the worms so that the pairs of bars are advanced by the worms, which worms are rotated by any suitable gearing, such as disclosed in the aforesaid application. The worms being located between the two chains will be engaged by the bars 11 and 12 when said bars

are moved together at the meeting portions of the chains, so that all of the bars along the adjacent runs of the chains will engage the worms to be driven positively thereby.

In order to cause the bars of the pairs to register, dowel pins 50 are secured in the bars 12 and have tapered projecting portions to enter recesses in the bars 11, and the tapered dowels entering the recesses in the bars 11 will cause the bars to come together accurately, as well as preventing longitudinal or transverse displacement of the bars of each pair. As shown, the dowel pins 50 are located between the recesses 12′ and worms 40.

In order to clamp the bars 11 and 12 of each pair together so as to hold them on the worms 40, leaf springs 52 are secured, as at 53, to the bars 12 and extend across the ends of the bars 12. Said springs 52 have hooks or catches 54 to engage over the bars 11 when the bars 11 and 12 are brought together, thereby preventing the bars of each pair from separating until the spring catches are disengaged from the bars 11. Cam fingers 55 project from the hooks 54 to enable the bars 11 to pass between the hooks 54 when the bars 11 and 12 are moved together, the bars 11 in moving between the free ends of the springs 52 engaging the fingers 55 and separating said springs. Then, when the bars are brought together the hooks 54 will snap over the bars 11, thereby holding the bars together until they reach the point where they separate. Cams 55′ are carried by the frame 10 at the point where the bars are separated, and lie in the paths of the fingers 55 to move said fingers outwardly and disengage the hooks 54 from the bars 11, thereby permitting the bars to separate. The spring catches automatically latch the bars together where they meet, and the cams 55′ unlock the bars where they separate, and from the point where the bars meet to the point where they separate the bars are latched together on the worms so as to be driven positively by said worms. This prevents the bars 11 and 12 from separating from the point of meeting to the point of separation, and the variable pressure on the material is obtained by the movement of the sleeves 13 on the bars 11.

The adjacent runs of the chains are guided by the lower and upper longitudinal series of rollers 56 and 57, respectively. Said rollers engage track members 58 and 58′ secured to the opposite edges of the bars 12 and sleeves 13, respectively, and the track members or wear pieces 58 and 58′ are preferably flanged. The bars 12 move over the lower rollers 56, while the bars 11 of the upper chain move under the rollers 57, whereby the adjacent runs of the chains pass between the upper and lower rollers, the upper rollers 57 pressing the sleeves or clamping members 13 down toward the bars 12 to obtain the desired pressure.

The series of rollers 56 are mounted on axles 63 having their ends engaged in apertures provided in pairs of longitudinal rails 61, which extend between the lower wheels 16, whereby the upper bars 12 of the lower chain are supported in the same horizontal plane. Each pair of rails or bars 61 is secured by bolts 62 within U-shaped supports 60 spaced apart longitudinally of the machine, and bolted or otherwise secured on cross beams 59 of the frame 10. The rollers 56 are thus supported from the frame, for supporting the upper run of the lower chain against depression, and the presser bars 12 may move freely over the rollers 56 with minimum friction and noise.

The rollers 57 of each longitudinal series are mounted on axles 64 which have their ends engaged in apertures in pairs of bars or rails 65 of short length arranged end to end. The rails or bars 61 are continuous from one end to the other, whereas the bars of the upper rollers 57 are divided at longitudinally spaced points, and each unit carries several rollers, whereby the units may swing relatively to one another in a vertical plane in which the rollers are disposed. The end portions of the bars 65 pivotally engage bolts or pivot members 66 extending through U-shaped hangers or supporting members 67, which serve to hingedly connect the adjacent ends of the bars 65. The hangers 67 are bolted or otherwise secured to cross or transverse beams 68 which are mounted for vertical movement. The end portions of the beams 68 are guided vertically between vertical guides 69 secured to side members of the frame 10, and pieces 71 are secured to the beams 68 and bear against the guide members 69 to prevent endwise movement of said beams.

The beams 68 are yieldingly depressed, for similarly depressing the rollers 57 and sleeves or members 13, to supply the pressure for pressing the material between the chains. Thus, vertical rods 72 extend through the beams 59 and 68 outwardly beyond the worms 40 and presser bars, and have heads or nuts 73 at their lower ends seating upwardly against the beams 59. Washers or disks 74 are disposed on said rods above the beams 68, and seat against nuts 75 screw-threaded on the upper terminals of the rod 72, and coiled springs 76 are confined between the disks 74 and beams 68, to depress said beams under considerable pressure. The pressure is regulated by adjusting the nuts 75.

In operation, the fruit, vegetables, cotton seed, or other material to be compressed or from which the juice, oil or other liquid or moisture is to be expressed, is passed between the adjacent runs of the chains.

When using the machine as a filter press for expressing juice, liquid or moisture from the material, it is preferable to use the sheet 19 of porous or foraminous material to confine the material therein, said sheet being folded together so as to surround the material, and also serving to filter the juice or liquid. As shown in Fig. 2, the edge portions of the sheet are folded into overlapping relation over the material. The worms 40 are rotated to advance the pairs of bars 11 and 12 the adjacent runs of the chains. When said bars move together, the bars 11 pass between the springs 52, thereby springing said springs apart, until the bars come together, at which time the hooks 54 snap over the bars 11 and latch the bars 11 and 12 together on the worms. The bars are therefore positively and effectively advanced by the worms. It will be noted that the sleeves or clamping members 13 may be loose while the bars are being brought together and latched, and the bars are therefore latched or secured together in advance of the application of pressure. Thus, the sleeves or members 13 do not move under the pressure rollers 57 until the bars 11 and 12 have been latched together. Then, the sleeves 13 passing under the rollers 57 will be pressed down by spring pressure, so as to squeeze or compress the material between the sleeves 13 and bars 12. The pressure may be regulated so as to increase as the chains advance between the rollers 56 and 57. When the bars reach the point where they separate, the fingers 55 passing the cams 55′ will be moved outwardly to disengage the hooks 54 from the bars 11, thereby permitting the bars 11 and 12 to separate.

Having thus described the invention, what is claimed as new is:—

1. In a machine of the character described, a pair of chains, a worm engaging the adjacent runs of said chains for driving them, and means carried by the chains for holding the adjacent runs thereof together.

2. In a machine of the character described, a pair of endless chains, a worm at the adjacent runs of said chains, said chains having nut portions to engage said worm for driving the chains from the worm, and catches carried by one chain to engage the other chain at the adjacent runs of the chains for holding said nut portions together on said worm.

3. In a machine of the character described, a pair of endless chains of transverse bars, and worms adjacent to the opposite edges of the adjacent runs of said chains, said bars of the two chains being adapted to bear together at the adjacent runs of the chains and having portions adapted to interengage and said bars having portions near their ends to engage said worms for driving the chains from said worms.

4. In a machine of the character described, a pair of endless chains, a worm between the adjacent runs of said chains, said chains having cooperable nut portions to embrace said worm for driving the chains from said worm, and means carried by the chains for holding the adjacent runs of the chains against separation while moving along said worm.

5. In a machine of the character described, a pair of chains of bars, a worm between the chains, said bars having nut portions to engage said worm, and means for latching the corresponding bars of the two chains together around the worm when moving along the worm.

6. In a machine of the character described, a pair of chains of transverse bars, a worm between said chains, said bars having nut portions to engage said worm, and means carried by the bars for holding the adjacent runs of the chains together to prevent said bars from separating.

7. In a machine of the character described, a pair of chains, a worm between said chains, the chains having portions to engage said worm, catches carried by one chain to engage the other chain for latching the chains together against separation at their adjacent runs, and means for unlatching the chains at a point of separation.

8. In a machine of the character described, a pair of chains of transverse bars, a worm between said chains, said bars having nut portions to engage the worm, spring catches carried by the bars of one chain and engageable with the bars of the other chain for holding the bars together at the adjacent runs of the chains, and means for disengaging said catches from the last named bars at a point of separation.

9. In a machine of the character described, pairs of chains of transverse bars hingedly connected, a worm between the chains for driving them, said bars having nut portions to engage said worm, leaf springs carried by the bars of one chain and having hooks to engage the bars of the other chain for holding the bars together at the adjacent runs of the chains, and means for disengaging said hooks from the last named bars when the bars reach a point of separation.

10. In a machine of the character described, a pair of chains of transverse bars, a worm for driving said bars, said bars of the two chains being adapted to bear together at the adjacent runs of the chains and having portions adapted to interengage and said bars having nut portions engageable with said worm, means for holding said bars together when moving along the worm, presser members carried by the bars of one chain and movable toward the bars of the other chain, and means for moving said members toward the last named chain.

11. In a machine of the character described, a pair of chains of transverse hingedly connected bars, a worm for driving said chains, said bars of the two chains being adapted to bear together at the adjacent runs of the chains and having portions adapted to interengage and said bars having nut portions to engage said worm, means for holding said bars together when movable along said worm, presser sleeves mounted on the bars of one chain, and means for moving said sleeves toward the bars of the other chain.

12. In a machine of the character described, a pair of chains of transverse bars, a worm for driving said bars, said bars having portions to engage said worm, latches carried by the bars of one chain to engage the bars of the other chain for holding the bars together against the worm, presser members carried by the bars of one chain movable toward the bars of the other chain, and means for moving said members toward the bars of the last named chain.

13. In a machine of the character described, a pair of chains of transverse hingedly connected bars, worms between said chains at the opposite edges of the chains, said bars having nut portions to engage said worms, catches carried by the bars of one chain to engage the bars of the other chain for holding the bars together in engagement with said worm, means for disengaging said catches from the last named bars when the bars reach a point of separation, presser sleeves on the bars of one chain movable toward and away from the bars of the other chain, and means for moving said sleeves toward the bars of the last named chain.

In testimony whereof I hereunto affix my signature.

ANGELO COLUMBRO.