

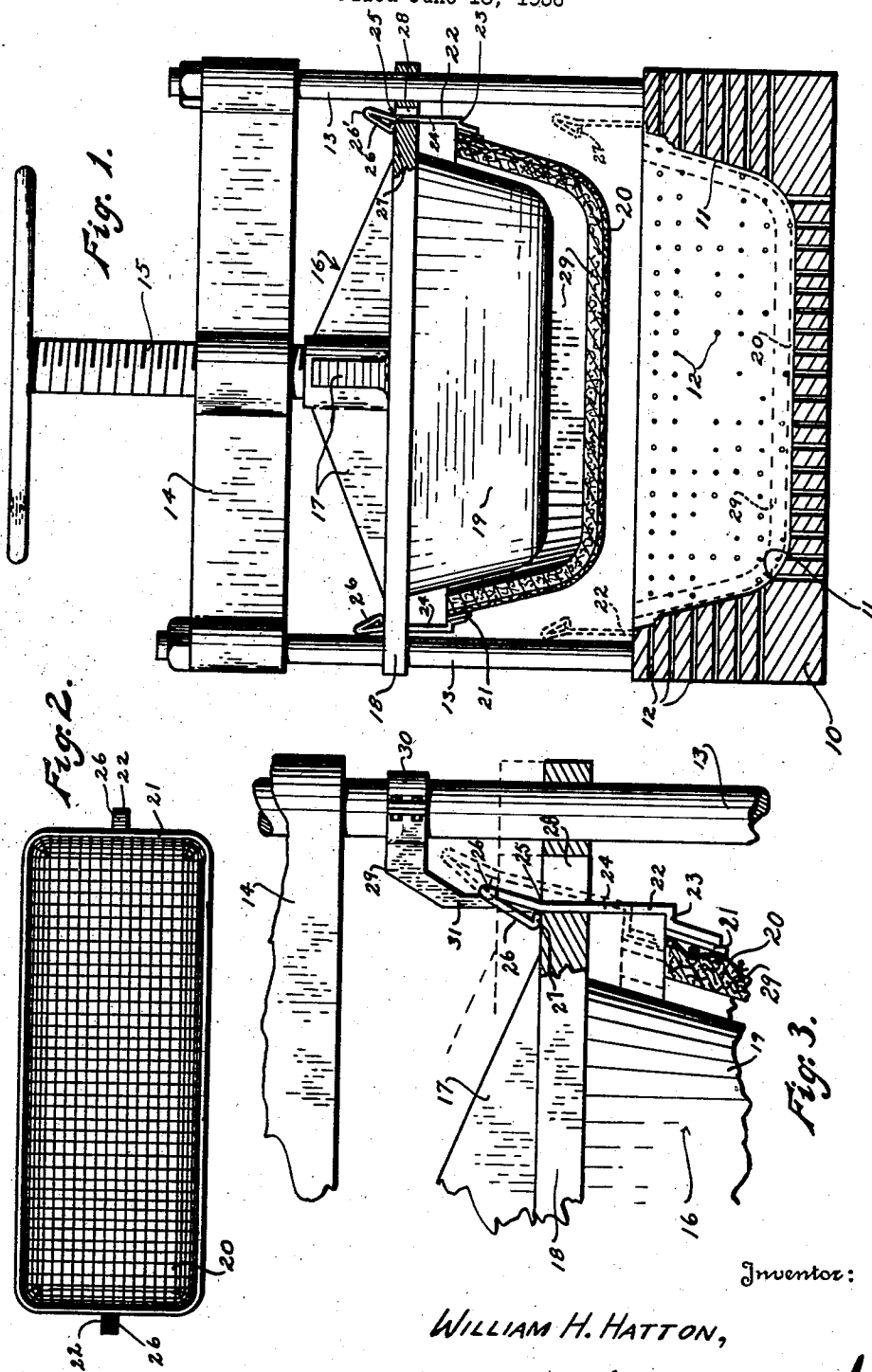
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APPARATUS FOR MOLDING PULP BODIES

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## APPARATUS FOR MOLDING PULP BODIES

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3 Claims. (Cl. 92—57)

My invention relates to improvements in apparatus for the manufacture of articles molded from pulpous fibrous material, its prime objects being to permit faster production a low cost and to effect even, strainless removal of the article without use of complicated apparatus or incorporation of stiffening members in the article, and to prevent distortion due to handling incident to its being racked for drying, thereby permitting faster, less delicate handling with safety, and rapid, low cost production.

Large and small structural articles of pressed fiber pulp material have been found desirable in the past, but their manufacture heretofore has presented impracticable aspects which have destroyed its feasibility in certain lines of manufacture. The present invention is designed to overcome the most serious of these difficulties. In forming an article from the fluid pulp, its strength or rigidity, and resistance to shear, increases from nearly zero when fluid to a maximum when dried. Lack of strength is no problem while the pulp is being formed and compacted in the mold. During its removal from the mold and during the early stages of drying, however, the freshly molded article is quite liable to deformation. Even a slight disturbance of forms may produce lines of weakness which are prone to fall later when the completed article is subjected to normal stresses of use or its shape may be altered beyond limits of tolerance. To obviate these and other faults it has been proposed even to embed reinforcing members in the article—an expense often unwarranted by the market for the article and which would be unnecessary in a well made article in which the foregoing objections are overcome.

It has also been a problem to effect the removal of the article from its mold, evenly and rapidly. I attain these and other objects of invention by the embodiment of the principles and methods herein described, a preferred form of which is shown and described.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention as will appear from the following description and accompanying drawing, wherein

Figure 1 is a vertical cross section of a press and an article in course of manufacture, in accordance with my invention.

Figure 2 is a plan of the wire-mesh basket.

Figure 3 is a detail of a modification of the detent and release means.

Various press machines may be utilized, but for the purpose of illustration there is shown a screw press mechanism of usual form, adapted to cooperate two dies upon the material to be formed. It includes a lower die member 10 having a recess die face 11 from which a multiplicity of ducts 12 lead, discharging at the outer surfaces of the die block.

Standards or tie-bars 13 are anchored at the sides of the member 10 and support a cross bar 14 through which is engaged the screw 15 which is journaled in and connected to the upper die block 16 in such manner as to protract and retract it relative to the lower die 10. The upper die block 16 is formed with flanges 17 to stiffen and distribute strains over its top plate 18 and with a die face 19 formed to define the dimensions of the finished article in conjunction with the contours of the lower die face 11.

A wire mesh basket 20 is provided, shaped to contact the die face 11 of the lower die 10, having a metal band rim 21 supporting its upper edges, and to which rim are attached resilient hook members 22. Said hook members 22 are preferably formed of sheet metal and are offset outwardly a distance immediately below the top of the basket, as at 23, extending thence upwardly from the rim of the basket a distance, their upper shank parts being extended perpendicularly to the plane of the top plate 18 as at 24. The upper end portions are then bent at 25 outwardly at a slight angle and are then bent sharply inward and downward at 26' and continued to a level below the bend 25, forming bills 26. The extremities of the bills are bent sharply outwardly forming a wear face 27 paralleling the top surface of the plate 18 and terminating adjacent the vertical portions of the hooks.

In the top plate 18 outside the die face portion there are formed apertures 28 aligned with respective hook members 22 in such manner that the inner edge of each aperture 28 impinges on the inclined face 26 of the hook 22 when the plate is lowered, thereby forcing it outwardly as the hook moves through the aperture 28. When the portion 27 passes the upper edge of the top plate 18 the hook springs inwardly in position to engage the face 27 of the hook against the top of the plate 18 when the latter reverses its motion and the upper die is being withdrawn from the lower die.

The construction places the apex 26 of the hook initially outward of the inner side of the opening 28 through which it passes and places the bill of the hook outside a vertical projec-

tion of the upper end edge of the basket (as will appear, this means that the hook is outside the path of the molded article as it is removed from the basket).

5 The modification and improvement shown in Figure 3 is designed to make the operation of the press more automatic. Strikes 29 are adjustably attached to the standards 13 adjacent the hook members 22. Each strike 29 comprises a clamping and supporting portion 30 adapted to be affixed to the standard 13 and a finger or strike portion 31 placed in alignment with the inclined faces 26 of the hooks 22. When the upper die has been raised a predetermined distance suitable to removal of the basket from the press, the fingers 31 engage the inclined faces 26 of the respective hooks 22, pressing them outwardly and permitting the hooks to be thrust through the aperture 28, releasing the basket 20, which is then removed and with its content placed on a rack for drying, or otherwise treated.

The operation is as follows: The basket 20 is placed in the lower die and a measured quantity of pulp 29 placed therein after which the dies are operated to compact the pulp, forcing excess water out through the ducts 12, the hooks 22 moving through and past the top plate 18. The dies are separated, the hooks 22 not immediately engaging, but permitting the upper die 16 to free itself from the molded article 29. Then the hooks engage the plate 18 and raise the basket and article 29 from the lower mold die 11. When sufficiently raised the fingers 31 operate the hooks 22, permitting the basket and contained molded article to be removed upon a plate or other support inserted to receive it. This last named means being available in various forms and comprising no novel part of the present invention is not shown herein. The article is now dried in any familiar way.

#### I claim:

1. Apparatus for forming molded pulp articles comprising a water-passing die, a complementary die adapted to coact with the female die to form the plastic material, a basket structure conforming to the article to be formed set between the dies, means to move the dies into and out of cooperative relation, and means on the basket and movable die constructed to coengage at initial open position of the dies whereby terminal relative movement of one die will move the basket and article from the other die.

2. In a die press machine of the character described, including a movable press member, a movable article support in advance of the movable press member, a resilient hook thereon, said hook having a bill and an inclined face extending therefrom outwardly and obliquely with respect to the path of the movable press member, means on the movable press member to engage the inclined face on pressing movement of the movable press member to enter into operative relation thereto, said bill spaced from the last named means at forming position of the movable press member but in the path of said means whereby the basket will be lifted after a predetermined separation movement of the dies.

3. In the structure of claim 2, a strike member outwardly of the movable press member in the direction of separating movement of the latter and positioned in line with the inclined face of said hook, near terminal separating position of the movable press member but in advance of said position, whereby the strike member will engage the inclined face and move the hook into disengaging position by outward movement of said movable press member.

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