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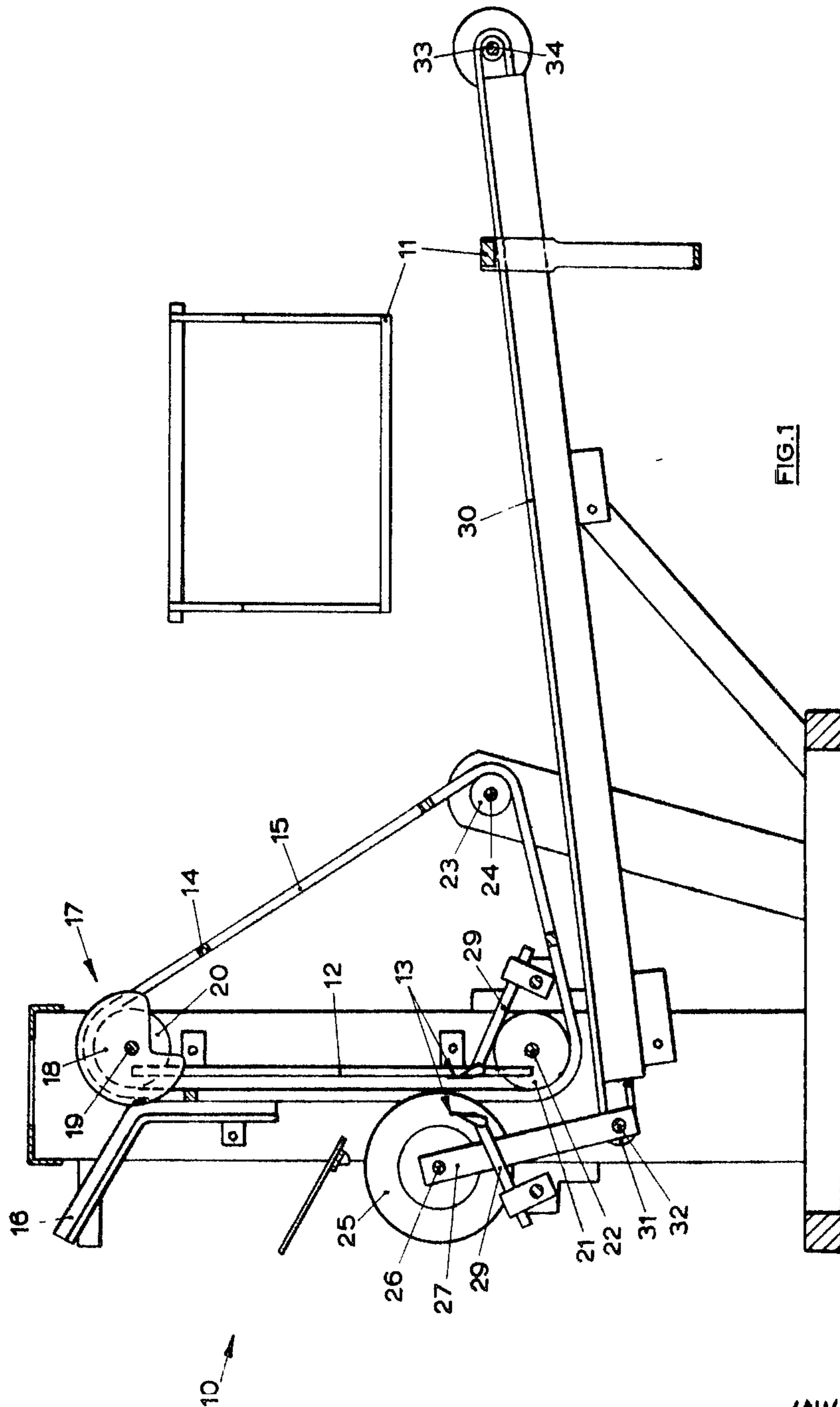
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3,581,324

HONEYCOMB UNCAPPING MACHINE

Filed Dec. 18, 1968

2 Sheets-Sheet 1



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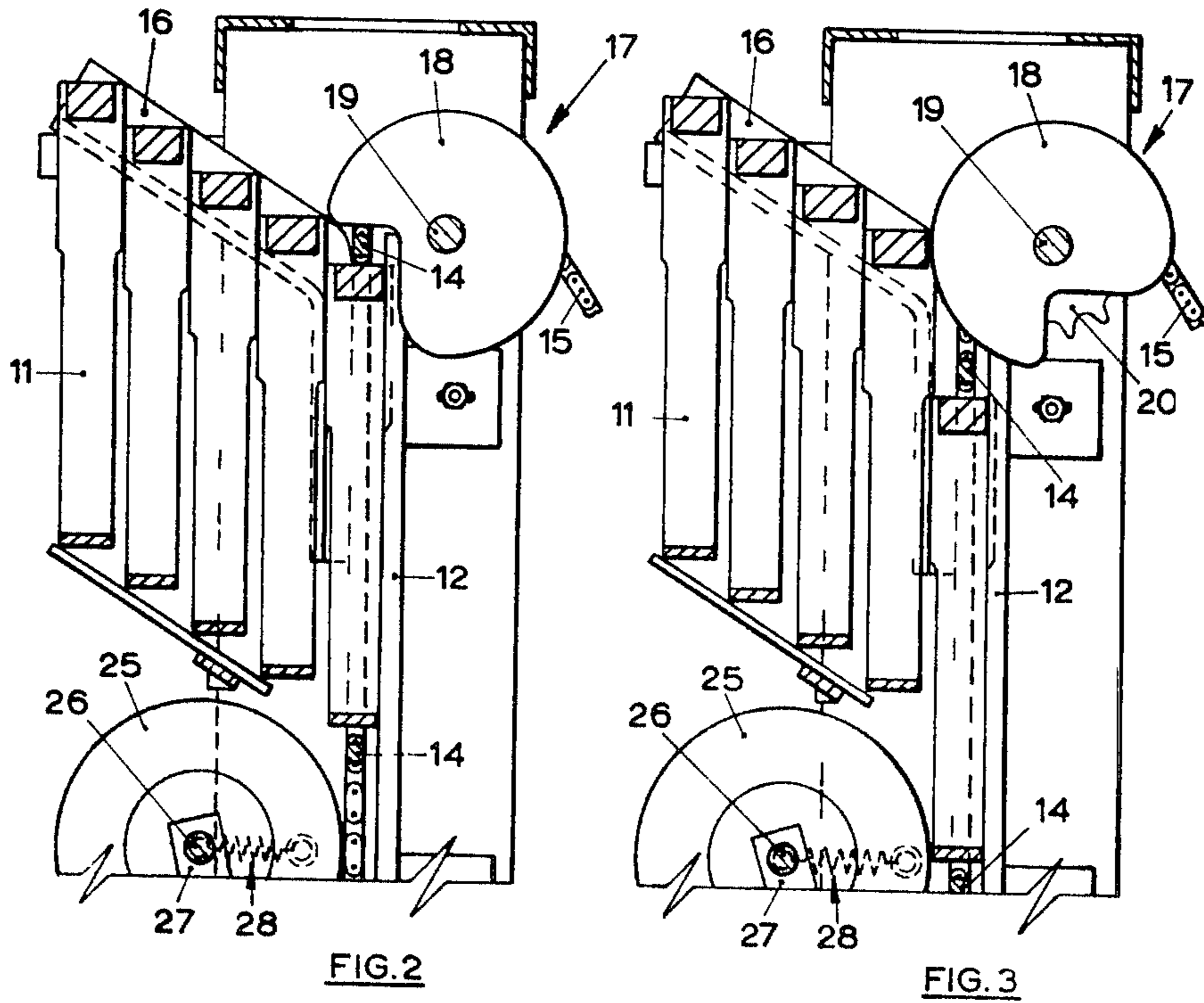


FIG. 2

FIG. 3

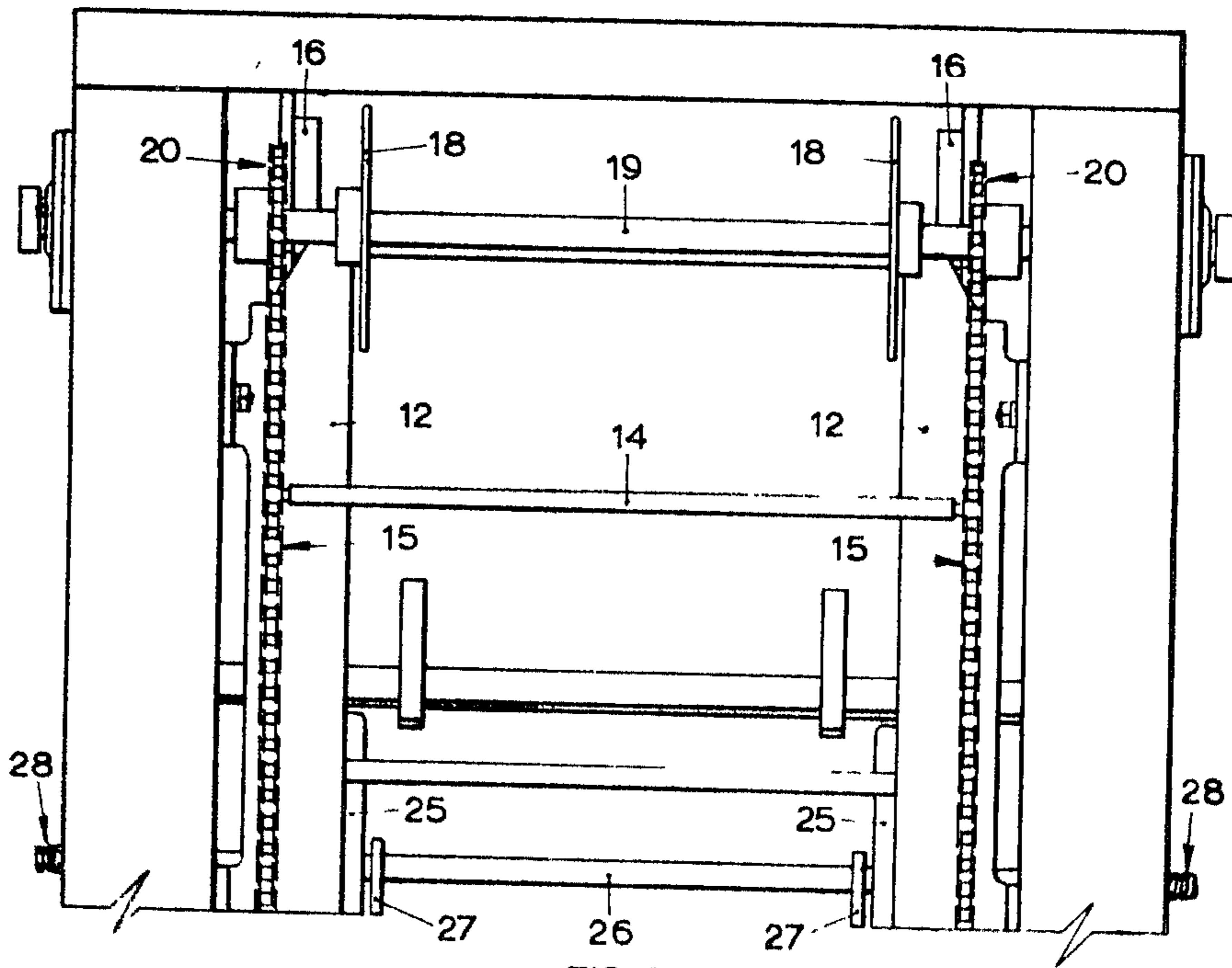


FIG. 4

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HONEYCOMB UNCAPPING MACHINE
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149,503
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U.S. Cl. 6—12 4 Claims

ABSTRACT OF THE DISCLOSURE

A honeycomb uncapping machine provided with mechanical loading means.

The invention relates to honeycomb uncapping machines, and in particular to mechanical means for loading such machines.

Commercially produced honeycombs are formed within rectangular frames made of wood, one side of each frame being extended at both ends so as to form two lugs whereby the frame can be supported in a vertical plane within a beehive or on a storage rack.

One known machine for uncapping honeycombs formed within frames of the type hereinbefore described, comprises rectilinear guides adapted to slidably support the frames in a vertical plane; two horizontal knives disposed one on each side of the vertical plane; and a plurality of horizontal bars supported between two endless chains, and adapted to move the frames, which are placed between the horizontal bars by hand, downwardly between the two knives.

Manual loading of the known machine is inefficient and expensive, as the machine must be tended constantly, and a certain degree of skill is required to place the frames between the horizontal bars whilst said bars are moving.

The object of the present invention is the provision of a machine similar in general construction to the known machine, but fitted with mechanical means for placing the frames between the horizontal bars.

According to the invention, a machine for uncapping honeycombs formed within frames of the type hereinbefore described, comprises rectilinear guides adapted to slidably support the frames in a vertical plane; two horizontal knives disposed one on each side of the vertical plane; a plurality of horizontal bars supported between two endless chains, and adapted to move the frames downwardly between the two knives; inclined rails disposed adjacent the upper ends of the rectilinear guides and adapted to support a plurality of the frames by means of the lugs provided thereon, the frames being disposed in parallel vertical planes and being influenced by gravity to slide down the inclined rails so as to engage the rectilinear guides; and means for controlling movement of the frames down the inclined rails so that the frames will be placed between the horizontal bars.

Preferably, the means for controlling movement of the frames down the inclined rails, comprise two cams secured to a horizontal shaft adapted to be rotated by the two endless chains supporting the horizontal bars, the cams being adapted to engage the side of each frame that is extended to form the two lugs whereby the frame is supported by the inclined rails.

A preferred embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings of which:

FIG. 1 is sectioned side elevation of a machine for uncapping honeycombs formed within frames of the type hereinbefore described;

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FIGS. 2 and 3 are sectioned side elevations of mechanical means for loading the machine; and

FIG. 4 is a rear view of the mechanical means for loading the machine.

In the preferred embodiment of the invention, a machine 10 for uncapping honeycombs formed within frames 11 of the type hereinbefore described, comprises rectilinear guides 12 adapted to slidably support the frames 11 in a vertical plane; two horizontal knives 13 disposed one on each side of the vertical plane; a plurality of horizontal bars 14 supported between two endless chains 15, and adapted to move the frames 11 downwardly between the two knives 13; inclined rails 16 disposed adjacent the upper ends of the rectilinear guides 12 and adapted to support a plurality of the frames 11 by means of the lugs provided thereon, the frames 11 being disposed in parallel vertical planes and being influenced by gravity to slide down the inclined rails 16 so as to engage the rectilinear guides 12; and means 17 for controlling movement of the frames 11 down the inclined rails 16 so that the frames 11 will be placed between the horizontal bars 14.

The means 17 for controlling movement of the frames 11 down the inclined rails 16, comprise two cams 18 secured to a horizontal shaft 19 adapted to be rotated by the two endless chains 15 supporting the horizontal bars 14, the cams 18 being adapted to engage the side of each frame 11 that is extended to form the two lugs whereby the frame 11 is supported by the inclined rails 16.

The two endless chains 15 supporting the horizontal bars 14 run on sprockets 20 secured to the shaft 19, on sprockets 21 secured to a drive shaft 22 disposed parallel to and vertically below the shaft 19, and on sprockets 23 secured to a shaft 24 disposed parallel to and rearwardly of the shaft 19.

Whilst the frames 11 are being moved downwardly by the horizontal bars 14, they are held against the rectilinear guides 12 by means of two rubber tyred wheels 25 rotatably mounted on a horizontal shaft 26, which is supported by two radius arms 27, and is adapted to be moved towards the rectilinear guides 12 by means of two tension springs 28.

The two knives 13 are supported by hollow, adjustable members 29 through which steam can be passed to heat the knives 13, and the portions of the honeycombs cut away by the knives 13 fall to the bottom of the machine 10 where they are collected for further processing.

Two endless chains 30 adapted to engage the two lugs provided on each frame 11, and to carry each frame 11 to an unloading point at the rear of the machine 10, are disposed below the endless chains 15.

The two endless chains 30 run on sprockets 31 secured to a horizontal drive shaft 32, and on sprockets 33 secured to a horizontal shaft 34.

In operation, a plurality of the frames 11 are placed on the inclined rails 16, and the cams 18 then ensure that the frames 11 are placed accurately between the horizontal bars 14.

Loading of the machine 10 thus requires less skill than hitherto, and the machine 10 is as a consequence more efficient and less expensive to operate.

I claim:

1. A machine for uncapping a honeycomb formed within a rectangular frame one side of which is extended at both ends to form a pair of lugs with each lug extending outwardly from the adjacent side of the frame for dependently supporting the frame in a vertical plane in a beehive or on a storage rack, the machine comprising a pair of horizontally spaced inclined rails arranged for slidably supporting the two lugs formed by the extended side of the frame so that the frame is supported by said inclined rails

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in a vertical plane, two vertically extending horizontally spaced rectilinear guides having the upper ends thereof disposed adjacent the lower ends of said inclined rails, said rectilinear guides arranged to engage the vertically extending sides of the frame for slidably supporting the frame in a vertical plane, resiliently biased means for urging the two vertically extending sides of the frame into frictional engagement with said rectilinear guides, a first horizontally arranged shaft located at the upper end of said rectilinear guides, a second horizontally arranged shaft located at the lower end of said rectilinear guides, a pair of spaced sprockets positioned on each of said first and second shafts, a pair of horizontally spaced endless chains each arranged to run on one of said sprockets on said first shaft and on said second shaft, at least one horizontally arranged bar extending between and secured at its ends to said endless chains and arranged to engage the extended side of the frame for pushing the frame downwardly within said rectilinear guides, means for controlling gravitational movement of the frame on said inclined rails for positioning the frame between said rectilinear guides and beneath said horizontally arranged bar for moving the frame from said inclined rails into engagement with said rectilinear guides, and two horizontally arranged knives disposed in parallel relationship and each located adjacent the lower ends of said rectilinear guides and arranged to uncap the honeycomb formed within the frame as the frame is moved downwardly through said rectilinear guides by said horizontally arranged bar.

2. A machine, as set forth in claim 1, wherein said means for urging the two vertically extending sides of the frame into frictional engagement with said rectilinear guides comprise a third horizontally arranged shaft located between and in generally parallel relationship with said first and second shafts and spaced laterally from said

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rectilinear guides, a pair of spaced radius arms pivotally supporting said third shaft, a pair of spaced rubber tyred wheels rotatably mounted on said third shaft, and a pair of tension springs arranged to resiliently bias said rubber tyred wheels toward said rectilinear guides so that said rubber tyred wheels engage the vertically extending sides of the frame as it passes downwardly through said rectilinear guides.

3. A machine, as set forth in claim 1, wherein said means for controlling gravitational movement of the frame on said inclined rails comprise two spaced cams positioned on said first horizontal shaft for rotation therewith, said cams arranged to engage the extended side of the frame having the lugs at positions spaced inwardly from the two adjacent sides of the frame which are positioned vertically on said inclined rails and within said rectilinear guides

4. A machine, as set forth in claim 1, wherein a second pair of spaced endless chains arranged to extend generally horizontally and outwardly from the lower end of said rectilinear guides with each of said second endless chains aligned below a different one of said endless chains supporting said horizontal bar, said second endless chains arranged to support the lugs of a frame received from said rectilinear guides and to transport the frame outwardly from the lower end of said rectilinear guide to an unloading position.

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