

Feb. 6, 1968

F. DALLAPE ET AL
MATERIAL HANDLING DEVICE

3,367,517

Filed May 25, 1966

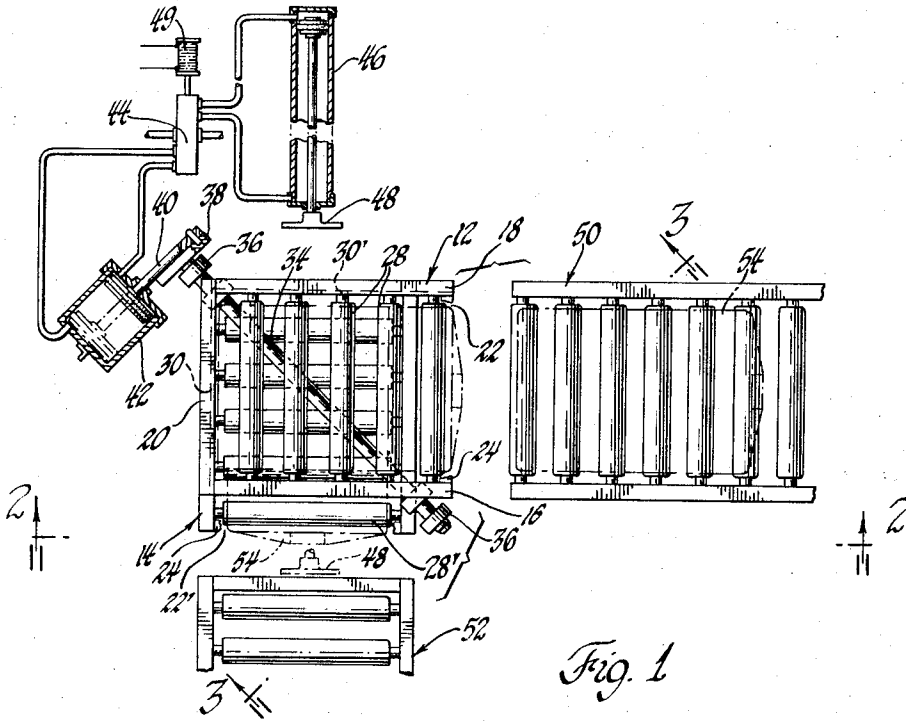


Fig. 1

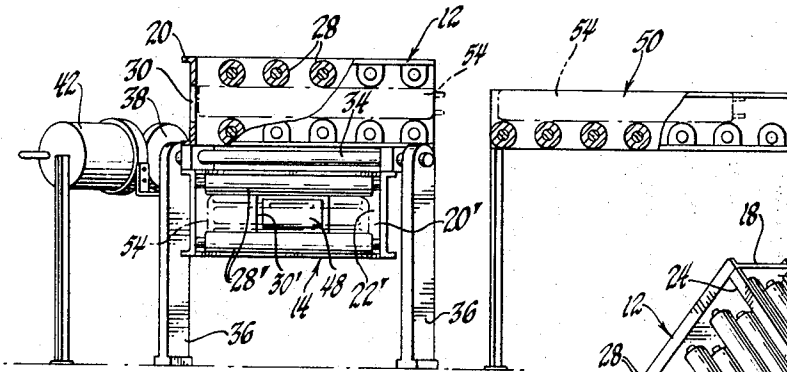


Fig. 2

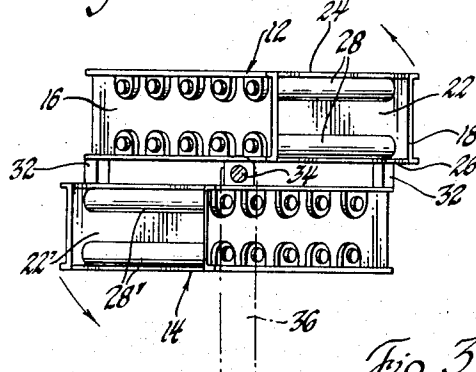


Fig. 3

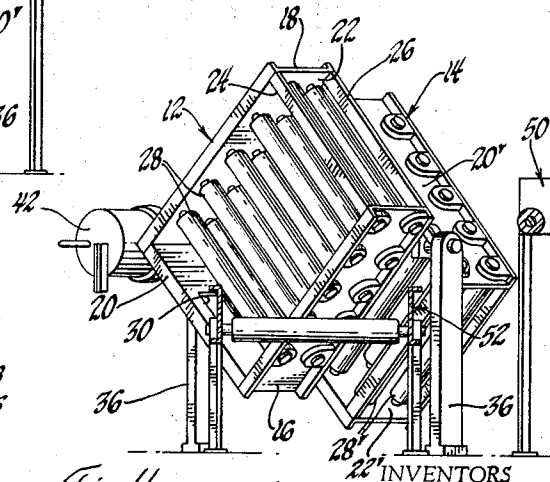


Fig. 4

INVENTORS
Fred Dallape, &
Kenneth Altkibberz

F. J. Fodale
ATTORNEY

1

3,367,517

MATERIAL HANDLING DEVICE

Fred Dallape and Kenneth McKibben, Defiance, Ohio, assignors to General Motors Corporation, Detroit, Mich., a corporation of Delaware

Filed May 25, 1966, Ser. No. 552,868

5 Claims. (Cl. 214-1)

Our invention relates generally to a material handling device and more particularly to a material handling device for turning over an object and changing its orientation 90°.

Such a device finds utility, for instance, in the handling of drag flasks in a foundry. A drag flask, in most instances, has to be inverted on a follower board so that sand can be tamped around a pattern within the drag flask. The drag flask is then turned over to its normal position for mating with the cope. It is highly desirable that this turn-over be accomplished in a minimum amount of space and yet be convenient to the operator, both factors being important in production since factory floor space and employee time are always at a premium. In its broadest aspect, the object of our invention is to provide a material handling device of simple construction for turning over an object and reorienting it 90° so that the turn-over is accomplished in a minimum amount of space and the turned over object is conveniently located with respect to its starting point.

Other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the annexed drawings, which illustrate a preferred embodiment, and wherein:

FIGURE 1 is a plan view of a material handling device in accordance with our invention.

FIGURE 2 is an elevation view of a material handling device as shown in FIGURE 1.

FIGURE 3 is a section view taken along the line 3-3 of FIGURE 1 and looking in the direction of the arrows.

FIGURE 4 is a partial elevation view of the material handling device in accordance with our invention showing the receptacles rotated approximately 90° from the position shown in FIGURES 1 and 2.

Referring now to the drawings and more specifically to FIGURES 1 and 2, our material handling device is seen to comprise a pair of receptacles indicated generally at 12 and 14, respectively. The receptacles 12 and 14 are identical so that a description of the receptacle 12 need only be given. The receptacle 12 is a box-like structure having a pair of parallel side walls 16 and 18 formed of channels, respectively. The back wall 20 is likewise formed from a channel 20. The front 22 is open and is formed by joining the upper and lower edges of the side walls with angle irons 24 and 26, respectively. The upper and lower walls of the receptacle 12 are provided by a number of spaced rollers 28 mounted on the edges of the side walls 16 and 18. The axes of the rollers 28 are parallel to the plane of the opening 22. The receptacle 12 is thus closed at all sides save the opening 22 and a small opening 30 of the back wall 20 for a purpose to be described later. The receptacle 14 is identical to the receptacle 12 except that it is reoriented 90° with respect to it. In other words, the opening 22' for the lower receptacle 14 lies in a plane perpendicular to the plane of the opening 22. This relationship is clearly shown in FIGURES 1, 2 and 3. As previously stated, the receptacle 14 is below receptacle 12. The receptacle 12 and 14 are connected to each other by four corner brackets 32. A shaft 34 extends across two diagonally opposite brackets 32. It is important that the shaft 34 extend between bracket between the openings 22 and 22' and the bracket opposite it. In other words, the axis of the shaft 34 intersects a plane angle, the legs of which are planes containing the openings 22

2

and 22', respectively. The ends of the shaft 34 are journaled in a pair of spaced upright mounts 36.

Referring now to FIGURE 1, it is seen that the upper left-hand end of the shaft 34 is provided with a crank 38 which is connected to piston 40 of fluid motor 42. The fluid motor 42 is connected to a source of pressurized fluid (not shown) through a suitable valve 44. The valve 44 also controls a second fluid motor 46 having a plunger 48 mounted to the outer end of its motor piston. The valve 44 may be suitably controlled as, for instance, by an electromagnetic actuating device 49. The plunger 48 is disposed adjacent the rear wall 20' of the lower receptacle 14 and when operated, it protrudes into the opening 30' to remove any object which is in the lower receptacle. Also shown is a conveyor 50 comprising side rails and a number of rollers. The conveyor 50 leads into the opening 22 of the receptacle 12. A second conveyor 52 comprising side rails and rollers is at right angles to the conveyor 50. It is likewise lower than conveyor 50 so that it aligns with the opening 22' of the lower receptacle 14.

The operation of our device is as follows. An object such as a drag flask 54 shown in phantom in FIGURE 1 is delivered into the upper receptacle 12 by the conveyor 50. Once the drag flask 54 has been received within the receptacle 12, it actuates a limit switch, not shown, which in turn controls valve 44 so that fluid is admitted to one side of motor 42. The rotates the receptacle 180° about the axis of the shaft 34. While we have shown our fluid motor diagrammatically, it is to be understood that in actual practice a more complicated type motor is required with provision for moving the crank through its dead center positions. However, the motor forms no part of our invention and many suitable power sources for accomplishing the 180° movement are available and well known. The receptacle 12 is now in the position formerly occupied by the receptacle 14 and the drag flask 54 has been turned over and reoriented 90°. When the flask 12 has been moved to this position, the valve 44 admits pressure to the upper side of motor 46 and actuates plunger 48 which then protrudes into receptacle 12 through opening 30, pushes the drag flask 54 out of the receptacle and onto the conveyor 52. The lower drag flask 14 is now in the upper position, formerly occupied by receptacle 12 and is ready to receive the next drag flask to be rolled over and reoriented 90°.

It should be understood, of course, that the foregoing disclosure relates to only a preferred embodiment of the invention and that it is intended to cover all changes and modifications of the example of the invention herein chosen for the purposes of the disclosure, which do not constitute departures from the spirit and scope of the invention.

We claim:

1. A material handling device comprising in combination:

a first receptacle having an opening,
a second receptacle mounted beneath said first receptacle and having an opening substantially perpendicular to the opening of said first receptacle,
a support, and
means to rotatably mount said first and second receptacles on said support for simultaneous rotation about an axis bisecting the plane angle formed by said openings whereby said device is adapted to receive an article, turn it over and reorient it 90°.

2. The material handling device as defined in claim 1 wherein said means comprises a shaft disposed between said receptacles and journaled at its ends in said support.

3. The material handling device as defined in claim 2 wherein each of said receptacles have a plurality of rollers on the upper and lower walls, the axis of said rollers be-

3

ing parallel to the opening of said receptacles, respectively.

4. The material handling device as defined in claim 3 including a first conveyor means adjacent said first opening and a second conveyor means adjacent said second opening. **5**

5. The material handling device as defined in claim 4 including pusher means extendable into the lower receptacle to remove an object therefrom.

4**References Cited****UNITED STATES PATENTS**

1,065,349	6/1913	Fletcher	-----	193—36
3,071,257	1/1963	Jones et al.		

GERALD M. FORLENZA, *Primary Examiner*.

F. E. WERNER, *Assistant Examiner*.