Feb. 25, 1969 H. W. BURGHER 3,429,456

SKID TURNER

Filed Oct. 20, 1966

Sheet 1 of 3

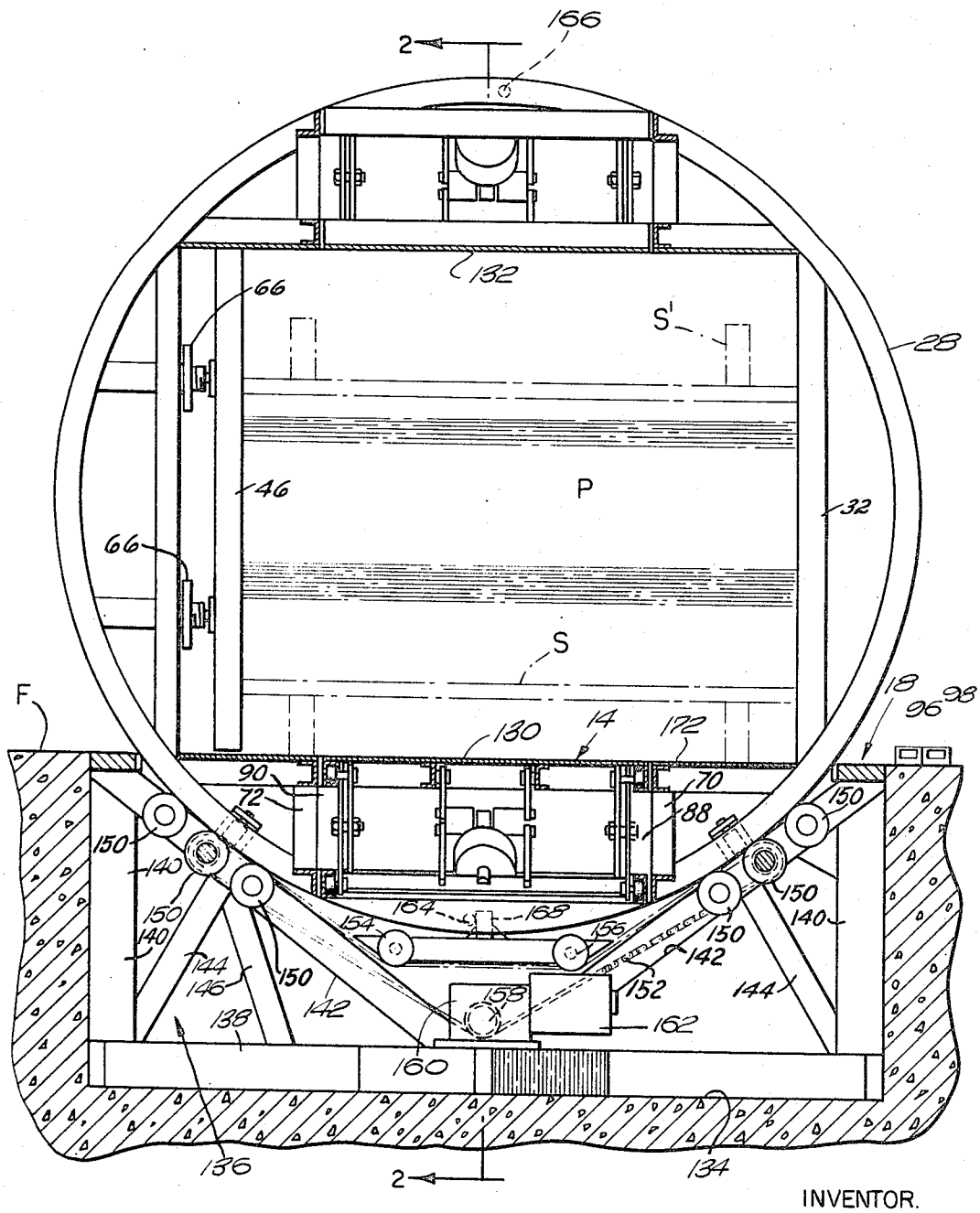


FIG. 1

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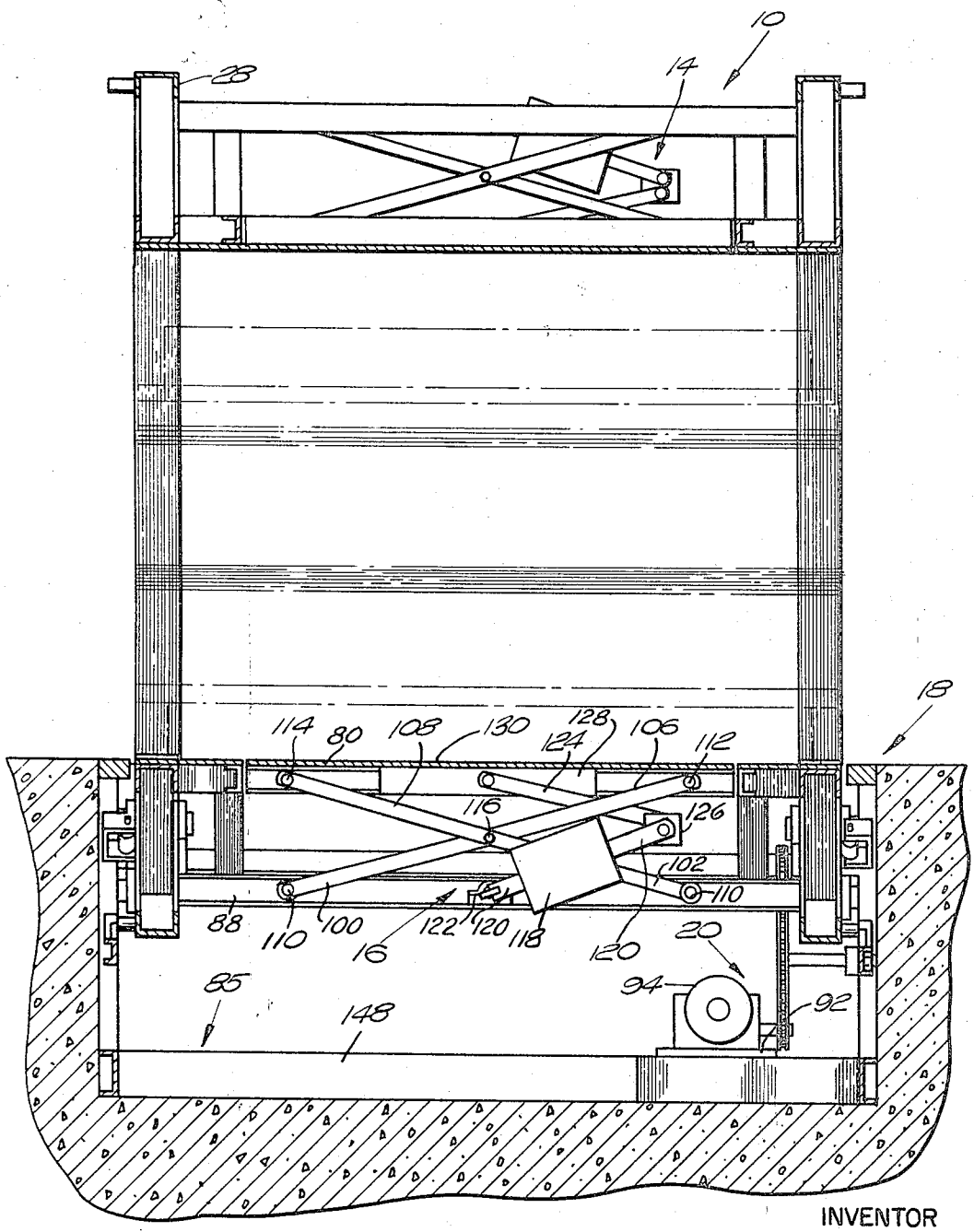


FIG. 2

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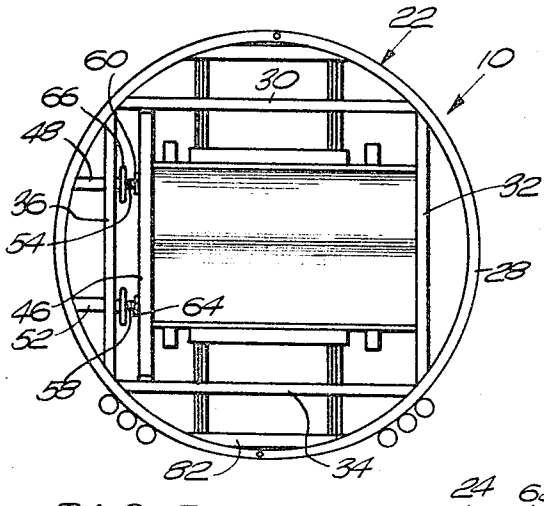


FIG. 3

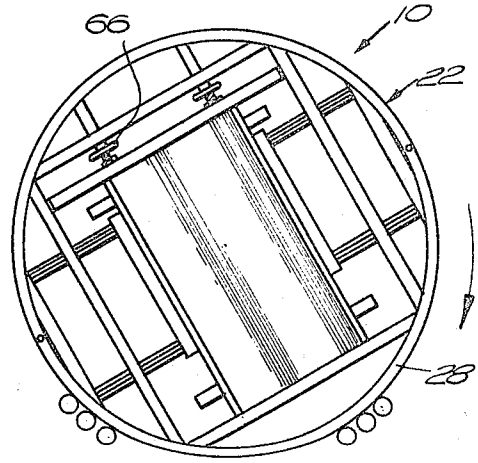


FIG. 4

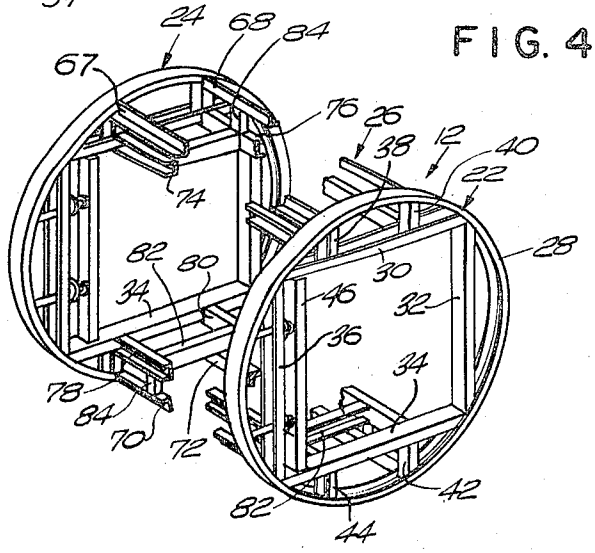


FIG. 5

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3,429,456

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U.S. Cl. 214—1 4 Claims
Int. Cl. B65g 7/00

ABSTRACT OF THE DISCLOSURE

A device for inverting a skid having a load mounted thereon and that includes a frame defined by a pair of rings that are disposed in spaced coaxial relation, the rings being interconnected and having rectangular openings formed therein for receiving the skid with the load mounted thereon, the rings being rotated to an inverted position for inverting the load as mounted on the skids that are clamped within the rectangular openings in the rings.

The present invention relates to improvements in skid turning devices.

Heretofore, the turning of skids has been a laborious, time-consuming expense requiring use of substantial floor space. The skids are awkward to turn because of their size and load. The skids, of course, comprise platforms, usually wooden, of rectangular shape upon which a load of sheets are supported. The sheets are in the process of being printed and after printing one side an entire stack of sheets on a skid must be inverted. The weight of such a stack can amount to several thousand pounds. Thus the need for satisfactory equipment for accomplishing such inversion facilely.

Accordingly, a primary object of the present invention is to provide an improved skid turning device wherein a loaded skid can be turned with minimal effort.

Another object of the present invention is to provide an improved skid turning device which can be turned within its own area thus obviating the need for extensive rolling area.

A further object of the present invention is to provide an improved skid turning device wherein the turning can be mechanically effected thus minimizing manual operations.

Still another object of the present invention is to provide an improved skid turning device wherein a skid can be loaded, clamped against a side wall and compressed along an axis perpendicular to the planes of the sheets, and automatically inverted or turned through 180°.

A still further object of the present invention is to provide an improved skid turning device wherein the means effecting inversion of a skid in the device is of simple, novel design and provides the additional function of support during turning.

Various other objects and advantages will become apparent from the detailed description to follow.

In the drawings:

FIGURE 1 is a front elevational view showing the skid turning device of the present invention;

FIGURE 2 is a vertical sectional view taken substantially on the plane of line 2—2 in FIGURE 1;

FIGURE 3 is a somewhat schematic front elevational view showing the device holding a skid in one position;

FIGURE 4 is a view similar to FIGURE 3 but showing the device in the process of inverting the skid;

FIGURE 5 is a somewhat schematic perspective view showing the framework of the device.

Referring more particularly to the drawings wherein like numerals apply to like parts throughout, it will be seen that I have provided an improved skid turning device 10 which includes a framework 12, fluid-operated systems 14, 16, supporting means 18 and inversion drive means 20.

The framework 12 is best shown in FIGURE 5 as including a pair of end ring subassemblies 22, 24 and the joinder structure 26.

The end ring subassembly 22 comprises a circular ring 28 formed of channel stock. Four channel shaped struts 30, 32, 34, 36 are rigidly permanently joined to the ring 28 along chordal axes and so as to form an open rectangle within the ring. Rigidifying frame elements 38, 40, 42, 44 are secured at their outer ends within the ring 28, 30 and at their inner ends to the struts 30, 34.

An adjustable clamping bar 46 is parallel to strut 36 and movably carried relative thereto. The means for adjusting the bar 46 will now be described. Two threaded cylinders 48, 52 are rigidly mounted between strut 36 and ring 28 and align with openings in the strut 36. Threaded shafts 54, 58 are received in the threaded cylinders 48 and 50, respectively, and are rotatably coupled by joints 60, 64 to the bar 46. The handles 66 can rotate the screws in and out of the respective cylinders for adjusting the positioning of bar 46, for a purpose to be described.

Ring 24 is similar to ring 22 and further detailed description is unnecessary.

The joinder structure 26 includes a number of longitudinal struts. Struts 67, 68, 70, 72 join the rings 28 at top and bottom and are of angle cross-section. Channel struts 74, 76; 78, 80 join the struts 30 and 34, respectively at top and bottom. Transverse bars 82 rigidly join the pairs of bars 74, 76 and 78, 80. Additional reinforcement can be provided as at 84.

The fluid operated systems 14, 16 are similar so a description of one will suffice for both. The base 86 of system 16 includes two side bars 88, 90 which are secured to the struts 78, 80 and transversely rigidified by plate 92 which carries pump 94 which is controlled by the two foot switches 96, 98.

Two pairs of crossed struts 100, 102 and 108, 106 are pivotally anchored at 116 and slidably, pivotally anchored at 110 at their bottom ends and similarly anchored at 112, 114. Pivots 116 are provided where the struts cross.

The fluid cylinder 118 operated by pump 94 is mounted between links 120 and pivotally anchored on bar 122. Linkage 124, 126 connects with links 120 and are pivotally anchored by bar 128. The upper links 124 are pivoted to the platform 130. The shaft 120 of cylinder 118 is connected to links 126 so that upon expansion or contraction operation of cylinder 118 the linkage acts to raise or lower platform 130.

The inverted platform 132 is operated by the same foot switches 96, 98 when a skid S is in position to be clamped.

The supporting means 18 comprises a recess formation 134 formed in a supporting surface such as floor F.

A framework 136 is formed in the recess and includes transverse horizontal members 138, vertical members 140 and inclined beams 142 with rigidifying struts 144, 146, all rigidly joined together, and opposite end frames being joined by longitudinal beams 148 as desired.

Three longitudinal supporting rollers 150 are journalled at each side of the recess on the inclined beams 142. Each center roller has a gear over which chain 152 is engaged. Idler gears are mounted at 154, 156 and a drive gear is provided at 158 on motor gear box 160 which has motor 162 drivingly connected thereto. Thus the center rollers can be driven together to cause rolling frictional contact with the end rings 28 whereby the entire structure can be supported by and rolled on the rollers by rotation of the center rollers.

As shown, the fluid system is supported on the longi-

tudinal struts **70**, **72** by securing the side bars **88**, **90** thereto, as seen best in FIGURE 1.

To effect stopping of the device upon 180° rotation stops are provided at **164**, **166** on rings **28** for abutment against fixed stop **168** on strut **170** bridging beams **142**.

In operation, a skid S having a load of sheets P is carried by a fork truck or the like into position and deposited on the inside floor wall section **172** supported on the channel struts **34** and **78**, **80**. A second inverted skid S' is placed on top the stack of sheets P.

Next, the clamping bars **46** are adjusted to the right as shown in FIGURE 1 to clamp the skid and its load against the struts **32** by operation of the hand wheels **66**. Then, the switch **96** is operated to rotate the rollers **150** which cause rotation of the device on the rollers in a clockwise direction as shown in FIGURE 4 until stop **166** engages stop **168**. The skid and its load, now inverted, can be removed. The device can be operated in a counterclockwise direction by operation of switch **98**, as will be understood.

Accordingly, it is believed that I have provided an improved skid turning device which fulfills the objects hereinbefore enumerated.

As this invention may be embodied in several forms without departing from the spirit or essentil characteristics thereof, the present embodiment is therefore illustrative and not restrictive.

I claim:

1. In a device for inverting a skid assembly having a load mounted thereon, a frame including a pair of rings that are disposed in spaced coaxial relation, frame elements interconnecting said rings, each of said rings having struts joined thereto in coplanar relation and that define a rectangular opening therebetween for receiving said skid assembly with the load mounted thereon, a clamping bar located in the rectangular opening of each ring and being adjustably mounted therein for engagement with the skid assembly and the load thereon, means for adjusting the position of said clamping bars relative to the skid assembly and load thereon for clamping the skid assembly and load in the rectangular openings as formed within said rings, an upper and lower platform located between said rings for movement with respect thereto, means for moving said platforms into engagement with said skid assembly,

wherein said platforms cooperate with said clamping bars to fix said skid assembly and load thereon against movement within said rectangular openings in said rings, and means engaging said rings for rotating said rings and the skid assembly with the load thereon to an inverted position.

2. In a device as set forth in claim **1**, a support for said frame including spaced inclined beams, said rotating means including a plurality of rollers rotatably mounted on each of said beams and receiving said rings thereon in engaging relation, means for rotatably driving one of the rollers on each beam, the driven roller on each beam frictionally driving the ring in engagement therewith to produce the rotating movement of said rings.

3. In a device as set forth in claim **1**, the skid assembly including a lower skid on which the load is mounted and an upper skid engaging the load and onto which the load is transferred when the frame is inverted, said platforms engaging said skids for retaining said skids in firm engagement with the load located therebetween.

4. In a device as set forth in claim **3**, a linkage control interconnected to each platform and being operable to effect the movement thereof, said linkage control including a scissors-type linkage interconnected to each platform and a fixed support, and a fluid operated control member interconnected to said fixed support and to a bar to which each platform is connected, wherein operation of said fluid operated control members vertically moves the bar connected to each platform, thereby extending the platforms in controlled relation into contact with said skids, said scissors-type linkage controls stabilizing the platforms in their extended positions.

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