Nov. 6, 1956 N. T. OHR 2,769,557

SKID INVERTER

Filed Feb. 11, 1953

Fig. 1

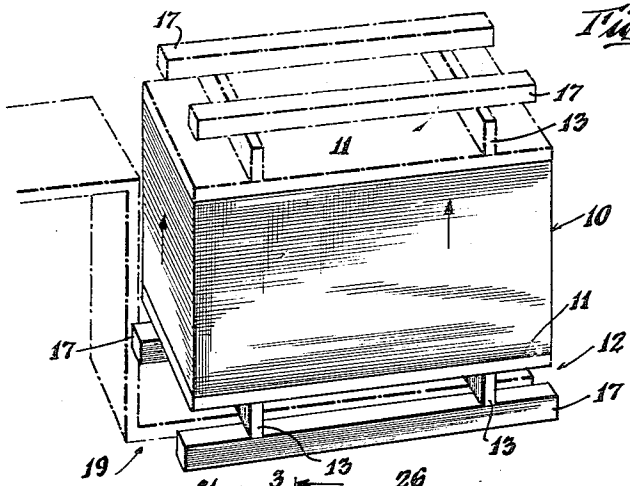


Fig. 2

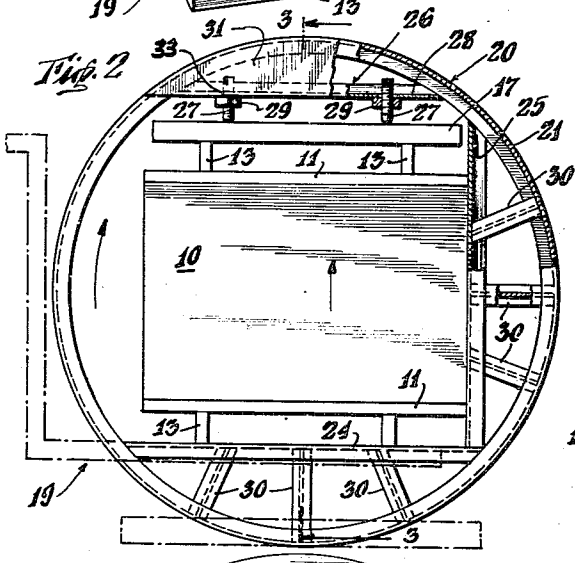


Fig. 3

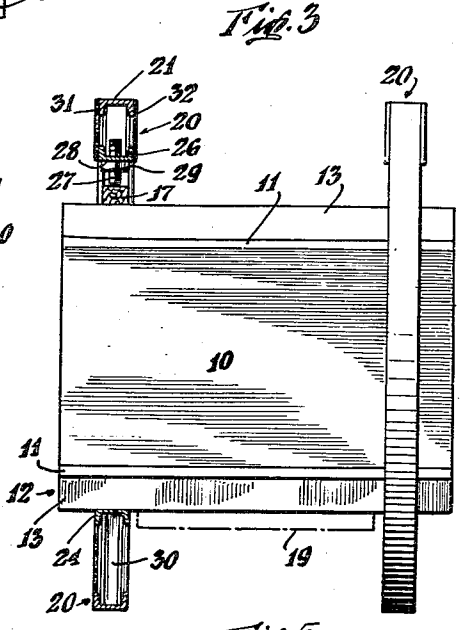


Fig. 4

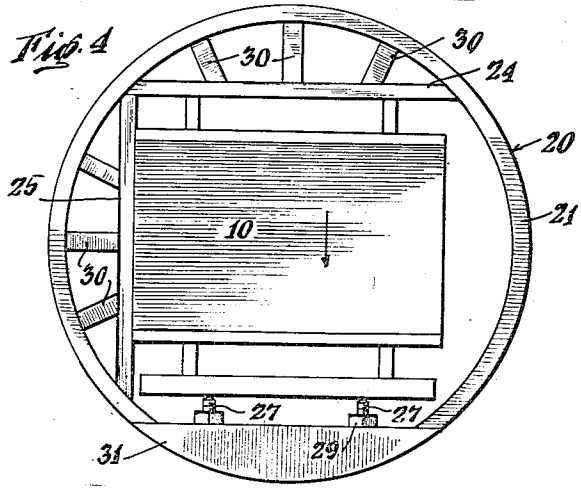
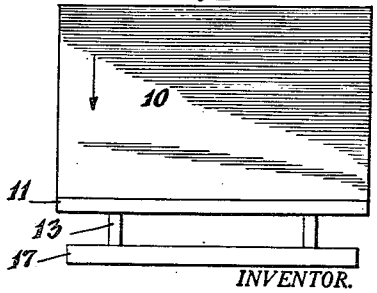


Fig. 5



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United States Patent Office 2,769,557 Patented Nov. 6, 1956

2,769,557

SKID INVERTER

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Application February 11, 1953, Serial No. 336,328

2 Claims. (Cl. 214—1)

The present invention relates to a method and device for inverting stacks of paper mounted on skids; a skid with a stack of paper on it is commonly referred to as a "skid" of paper.

In the printing industry, sheets of paper are printed or lithographed on both sides. The sheets come off a printing press at a rapid rate printed on one side and are stacked on skids. In order to print the other side of these sheets, the stacks of paper should be inverted and fed through the same or another printing press.

A stack of paper may weigh several hundred pounds depending upon the size of the sheets and the height of the stack. With a heavy stack, it is not feasible to invert by hand in one operation. It is necessary that portions be removed and inverted successively to form a second stack. This is time-consuming; in addition, the different portions of the stack are not likely to be accurately aligned.

The present invention aims to provide a method and device for inverting a complete stack in a single operation regardless of its weight and to accomplish this with a simple mechanism and with a minimum of time and labor.

An object of the present invention is to provide a new and improved inverting device.

Another object of the invention is to provide a new and improved inverting device or attachment which is particularly adapted to use with a stack of sheets.

Another object of the invention is to provide a new and improved inverting device or attachment which is particularly adapted to use with a stack of sheets of paper that are printed on one side and are to be printed on a reverse side.

Another object of the invention is to provide a new and improved method of inverting sheets.

A still further object of the invention is to provide a new and improved method of inverting sheets of paper that are printed on one side and are to be printed on a reverse side.

Other and further objects of the invention will be obvious upon an understanding of the illustrative embodiment about to be described, or will be indicated in the appended claims, and various advantages not referred to herein will occur to one skilled in the art upon employment of the invention in practice.

A preferred embodiment of the invention has been chosen for purposes of illustration and description and is shown in the accompanying drawings, forming a part of the specification, wherein:

Fig. 1 is a perspective view of a skid of paper resting on the floor or on any suitable surface, for example, at the delivery end of a printing press;

Fig. 2 is an end view partly in section of the skid of paper shown in Fig. 1 with the inverting device in position thereon before inversion;

Fig. 3 is a side elevational view partly in section of the skid of paper with the inverting device in position thereon;

Fig. 4 is an end view similar to Fig. 2 after the inverting operation; and

Fig. 5 shows the skid of paper in inverted position with the inverting device removed and ready to be fed into a press.

Referring again to the drawings illustrating a preferred embodiment of the invention and one way of performing the method, there is shown in Fig. 1 a stack of paper **10** mounted on a skid **12**. In actual operation, the paper would be dropped sheet by sheet on the skid **12** at the delivery end of a printing press. The skid preferably comprises a flat upper platform **11** made of wood or other suitable material with a pair of runners **13** supporting it. In order to facilitate the inverting operation and particularly the raising of the stack and skid by a lift truck, there is provided a pair of cross members **17** placed under the runners **13**.

In the customary operation of lifting a skid of paper by a lift truck, the platform of the lift truck usually passes between the runners **13**. The inverting mechanism cannot readily be applied with the platform of the truck in this position. The additional cross members **17** permit a lift truck **19** to run its platform at right angles to and under runners **13** (Fig. 1). In this way, the stack of paper and the skid on which it rests may be raised off the floor so that the inverting mechanism may be readily applied to the skid of paper. Instead of using members **17** to provide a space under runners **13** for the lift truck platform, slots may be cut in runners **13** to allow the platform to be slid underneath.

In the preferred embodiment of the invention, a pair of hoop-like members **20** are provided for application to the skid of paper to permit the inverting operation. The hoop-like members **20** are shown more particularly in Figs. 2 and 3. Preferably the two hoop members are alike and only one will be described. While the construction of these members may be varied, the preferred embodiment comprises a channel member **21** bent into a circle and properly welded or otherwise secured to maintain the circular construction. Within the circular channel member **21** suitable supports are provided for engaging and retaining the skid of paper on three sides. This may be achieved by utilizing three channel members indicated in Fig. 2 at **24**, **25** and **26** which form substantially a square or rectangular space for receiving the skid of paper. The lower channel member **24** may be welded at its ends to the circular member **21** and supported at its middle by three bracing members **30** which preferably have I-sections for strength and which may be suitably welded or rivetted in position as desired.

The supporting channel member **25** is welded or bolted at one end to the circular channel member and at the other end to the lower supporting channel member **24** and may be supported at its middle by three additional members **30** similarly to that of the member **24**.

At the upper part of the circular channel member **21**, a supporting channel member **26** extends parallel to the lower supporting channel member **24**. The upper supporting channel member **26** is preferably bolted or welded to the circular channel member **21** and may be further supported by a pair of plates **31** and **32** welded to the sides of the channel member **21** and to the sides of the channel member **26**.

The channel member **26** has provided at the bottom of the channel a pair of studs **27** which are threaded into suitable threaded apertures **33** in the bottom **28** of the channel **26** with lugs or hand wheels **29** formed thereon to turn the threaded studs **27** in order to vary the distances they protrude from the channel member to securely hold a skid of paper in position.

In the inverting operation, a skid in inverted position is

placed on top of the stack as shown in Figure 1. A lift truck **19** passes its platform between the cross members **17** under the lower skid and raises the stack and skid off the supporting surface. While thus raised, the hoops are passed about the skids into proper position or the hoops may be held in vertical position and the skid of paper moved through the hoops with a lift truck. The lift truck then lowers the stack so that the bottom skid rests upon the supporting channel **24** with one side of the stack adjacent to the vertical channel **25**. The operator turns lugs **29** to bring the ends of the studs **27** firmly into engagement with the cross members **17** of the inverted skid on the top of the stack. The number and position of studs **27** and the cross members **17** may of course be changed for different weights of paper **10**. Thus, the stack of paper with skids on the top and bottom is firmly held between the lower supporting channel member **24** and upper channel member **26**.

Since the hoops are resting on the floor or on any other suitable support they may be rolled to invert the stack. When inverted as shown in Fig. 4, the stack will be supported by the skid which was formerly on the top of the stack and which now rests on the studs **27**. Preferably, the hoops are rolled in a clockwise direction so that the edge of the stack will be supported at the 90° point by the side or vertical channel member **25**. When the inversion is complete the lift truck again is used to raise the stack and the hoops off the floor so that the hoops may be removed from the skid of paper. Prior to the removing operation an operator loosens the studs **27** which permits the removal of the hoops.

While the preferred embodiment of the invention contemplates the use of a pair of hoops in the inverting operation, it should be understood that a single hoop mounted at the center of the stack could be utilized. In that case, the operator would support the respective ends of the stack during the inverting operation. While this would be difficult with a heavy stack, it would be entirely feasible with lighter stacks.

In the description, the inverted skid on the top of the stack is indicated in position at the time the hoops are placed on the skid of paper. It should be understood that the second skid on the top of the stack may be applied after the hoops are about the skid of paper. This will allow greater clearance between the top and bottom supporting members of the hoop during the application of the hoop to the skid of paper. Likewise, the skid on the top of the stack, after the inverting operation, may be removed prior to the removal of the hoops. While a lift truck has been described herein for raising the skid of paper at the time the hoops are applied and at the time they are removed, it will be understood that suitable jacks could be used for the same purpose.

As a matter of fact, the skid of paper could be placed on shims to give it the proper height so that the hoops could be applied without the stack being raised by a lift truck. In the removal of the hoops, shims or other supports could be placed under the lower skid and the studs **27** lowered or loosened to permit removal of the hoops.

It will be seen that the present invention provides an improved method and device for inverting skids of paper or other stacks of sheet material. The mechanism is simple in construction and readily made from structural steel or aluminum, aluminum being preferred by reason of its lighter weight. The device is rugged in construction and fully capable of withstanding the rough usage to which it may be subjected. The time and labor involved in inverting stacks of paper is minimized and simplified.

As various changes may be made in the form, construction and arrangement of the parts herein without departing from the spirit and scope of the invention and without sacrificing any of its advantages, it is to be understood that all matter herein is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. A device for inverting sheets of material stacked on a skid comprising a rigid hoop of circular unobstructed outline, at least two substantially perpendicular chord sections on said hoop adapted to receive adjacent sides of a stack of sheets, another chord section opposite one of said perpendicular chord sections, said last-mentioned chord section having clamping screws extending therefrom to clamp said stack of sheet material in said chord sections, whereby said hoop may invert said stack of sheets while maintaining alignment thereof.

2. A device for inverting sheets of material stacked on a skid comprising a rigid hoop of circular unobstructed outline, said hoop having a receiving chamber therein comprised of an open side to accommodate sheets of greater width and having a top chord section, a bottom chord section parallel to said top chord section, and a side chord section perpendicular to and connected to said top and bottom chord sections, said top chord section having adjustable clamping means therein adapted to clamp said stack of sheet material against the bottom chord section, whereby said hoop may invert said stack while maintaining it in position.

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