

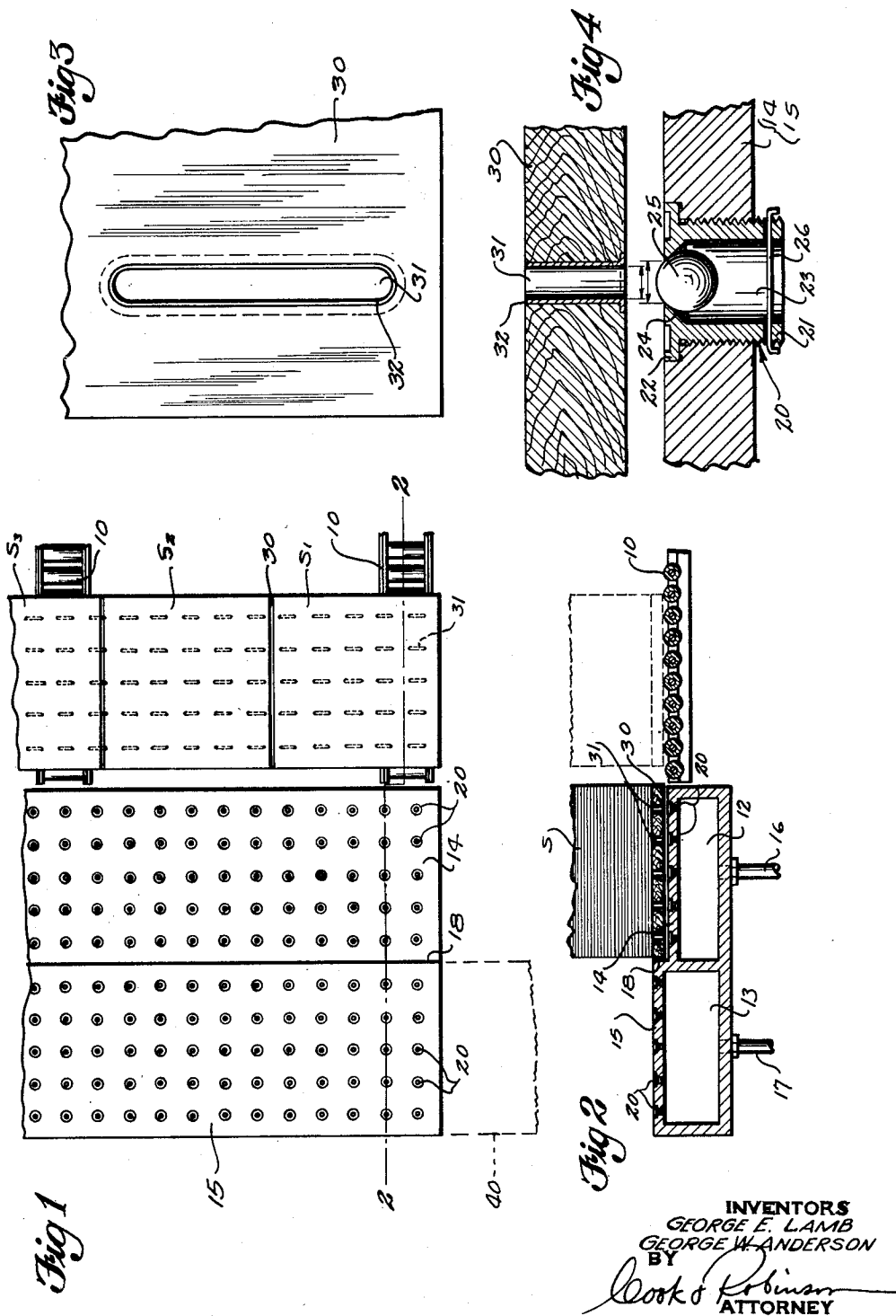
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CONVEYER

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CONVEYER

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This invention relates to conveyers or package transfer means, and has reference more particularly to devices of that character used in association with paper or pulp trimming, stacking and wrapping machines; it being the principal object of this invention to provide novel means for use in combination with the conveyer which delivers stacked material from the machine, known as the layboy, whereby an easier conveying and transferring of stacks of cut paper or pulp to various locations in a plant may be accomplished; it being explained that it is the general rule that such stacks of material be conveyed upon flat baseboards in order that travel of the stacks over the conveying means will not operate to cause the sheets in the stack to creep out of vertical alinement.

More specifically stated, the present invention resides in the provision of means whereby a stack composed of sheets of pulp, or paper, may be conveyed without the use of the usual baseboard and without causing the sheets in the stack to creep.

Explanatory to the present invention, it will be stated that previously, many different types of conveyers for stacked sheet materials have been used, the most common of which, in the pulp industry, comprises parallel cylindrical rollers in close relation, or endless belts operable about pulley wheels. With both types of such conveyers, certain disadvantages have been encountered, one of which is the inconvenience that results from the necessity of using the previously mentioned baseboards upon which the stacks are placed in order that the travel over the undulatory surface formed by the rollers or over the supports for the endless belts will not cause the sheets in the stack to creep out of vertical alinement. Another inconvenience resides in the fact that considerable effort is required to remove the stacks from the baseboards without getting the sheets in the stack out of alinement.

It will be here stated that the desirability of keeping the sheets in proper vertical alinement is due to certain treatment subsequently to be given to the material while still in its stacked form, and which necessitates that the edges of the sheets in the stack be perfectly alined in order to obtain the most satisfactory results.

In view of the above, it has been the principal object of this invention to provide novel means whereby stacks of sheets of pulp, or paper, delivered upon the baseboards as above mentioned, may be easily and readily removed from the boards onto a conveyer system and then trans-

ported on this conveyer system to different locations without disturbing the true vertical alinement of the sheets in the stack, and in an easy and convenient manner.

More specifically stated, the present invention resides in the eliminating of all undulatory action in the transfer of stacked material, by use of means employing air under pressure for the support and flotation of the stacks of material during the operation of transferring them from one place to another after being removed from the baseboard, and also providing for the use of air under pressure in the removing of the stacks of material from the baseboards.

Still another object of the invention resides in the provision of a special form of board in combination with air under pressure for use in the present method of transferring materials.

Still further objects of the invention reside in the details of construction of the various parts of the conveyer base plates or platforms and in their combination with the baseboard of special form, and in the mode of use of the various parts, as will hereinafter be fully described.

In accomplishing these and other objects of the invention, which will become apparent as the description progresses, we have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawing, wherein:

Fig. 1 is a plan view of a portion of a conveyer system embodying the present invention.

Fig. 2 is a vertical cross section taken on the line 2—2 in Fig. 1, illustrating the offset relation of the valved bed plates or platforms forming a part of the system.

Fig. 3 is an enlarged, plan view of a part of a baseboard or receiving board upon which a stack of cut paper or pulp may be conveyed from the layboy.

Fig. 4 is an enlarged, vertical cross section of a part of a baseboard and of the conveyer platform; particularly illustrating a valve herein.

Briefly described, the present conveyer or transfer means as embodied by this invention, comprises two adjacent platforms or bed plates, with their top surfaces perfectly flat and disposed in horizontal planes, but with the top surface of one offset below the level of the other a definite distance which is just slightly greater than the thickness of the baseboard on which stacks are formed by discharge of sheets of pulp or paper from the layboy. Each bed plate or platform forms the top wall of a hollow, air-tight chamber adapted to be charged with air under pressure,

and each platform is equipped at regular and somewhat close intervals with air release valves adapted to be automatically opened by contact therewith of a baseboard on which a stack of paper or pulp may be advanced, onto or across the platform, or by the stack itself. The baseboard in this case is equipped with air slits, or passages, therein which provide when the baseboard with the stack of pulp or paper disposed thereon is moved onto the platform of lower elevation, it will effect the opening of the valves therein for the release of air under pressure through the slits of the board to act against the base surface of the stack thereon in such manner that the stack will be floated on air, and may be easily moved onto the adjacent platform and, when disposed on the latter, will operate as the baseboard did in the first instance, to automatically open the valves in the second platform for the release of air to the under side of the stack to provide that it may then be conveyed on air along the second platform.

Referring more in detail to the drawing—

In Fig. 1, we have shown, in plan view, the parts of the present conveying means embodied by the present invention. In this view, 10 designates a portion of a roller conveyer or transfer system, which may be that associated with the discharge end of a layboy, not herein shown, whereby sheets of pulp or paper of equal size are formed in stacks upon a baseboard for conveyance from the layboy to various parts of a plant for wrapping or storage. In the present instance, the conveyer 10 leads to the previously mentioned valved platforms or bed plates, as shown best in Fig. 2. These bed plates are designated respectively by reference characters 14 and 15, and they form the top walls of separate air tight chambers 12 and 13, adapted to be maintained charged with air under pressure by reason of connection with a suitable source of air, not here shown, through pipe connections designated at 16 and 17.

It will be noted that the two platforms or bed plates 14 and 15 are horizontally disposed and that the plate 14 is disposed at a lower level than plate 15, a distance that is equal to the thickness of the baseboards 30 used for the conveyance of the stacks of material on conveyer 10, and it will further be noted that each platform is provided over its surface with automatic air release valves, 20, later described in detail, whereby air will be released for flotation of the stack of pulp.

Referring now to Fig. 4, it will be noted that each valve 20 comprises an externally threaded sleeve 21 that is threaded through the platform or bed plate and is equipped at its upper end with an encircling flange 22 that limits the entrance of the upper end of the sleeve to a position flush with the top surface of the platform. Formed in the upper end of the sleeve is a valve seat 24 against which a ball valve 25 is disposed. A pin 26 is extended through the lower end of the sleeve to retain the ball in an operable position relative to the seat.

It will be understood that air pressure within the chambers will operate normally to hold the ball valves seated and thus prevent the escape of air. However, as will be noted in Fig. 4, each ball, when seated, extends slightly beyond the top surface of the plate and therefore will be depressed to an open position incident to a baseboard or stack of pulp being disposed upon the top surface of the platform.

Referring now to the details of construction of the baseboard 30: It will be noted by reference to Figs. 3 and 4 that the board is provided over its surface with air slots or passages 31, with metal lining sleeves 32 for protective purposes. These slots are directed lengthwise of the board and transversely of the direction of travel of the board when moving from conveyer 10 onto bed plate 14. Also, the slots are somewhat narrower than the diameter of the ball valve seats for a purpose presently understood.

It is to be understood that the conveyer 10 is so disposed that a stack of paper or pulp supported on a base board 30 may be discharged from the conveyer 10 directly onto the bed plate 14 and when so discharged, the board will finally come into edge to edge abutment with the bed plate 15, as noted by reference to Fig. 2. It is a condition also that the slots 31 in the baseboard 30 are so located therein that when the board 30 comes into abutment with the edge of bed plate 15, as seen in Fig. 2, the slots therein will be in registration with the valves in plate 14 and the balls of the valves will be depressed slightly to open positions for release of air through the valves and slots to the bottom surface of the stack of pulp or paper then on the board.

Assuming the parts to be so constructed and assembled, their use and mode of operation is as follows:

In the manufacture of paper, cardboard, pulp, or the like, the material, in sheet form, is passed through a machine which trims and cuts the paper to a predetermined size and stacks it in regular piles upon the receiving or base board 30. Usually a plurality of stacks are formed, as shown in Fig. 1, and designated by S1, S2 and S3. When a stack or stacks have been built up to a desired height on the board, it is discharged, or removed from the machine, and other stacks started upon another baseboard. The completed stack or stacks are moved from the machine by means of the conveyer 10, embodying the cylindrical rollers, to the receiving platform 14 of the present conveyer mechanism. As this board 30 passes from conveyer 10 onto the top surface of the receiving platform, the balls 25 within the valves 20 will be depressed by the leading edge of the baseboard within the valve sleeves 22 and air will be discharged. The air within the chamber 12 will be maintained at such pressure that it will have a tendency to lift the board and stack of paper thereon to just clear the top of the receiving platform 14. The air escaping through the valve sleeves will be restricted by the presence of the board to such extent that it will not be of sufficient velocity or pressure to lift the balls 25 back to their seats to close the valves. In this way, the baseboard and stack may be floated on air completely onto the receiving platform 14 and up against the edge of plate or platform 15.

As will be noted by reference to Fig. 2, the receiving platform 14 is somewhat lower than the transfer platform 15 and thus there is a vertical step or shoulder 18 at the junction of the two platforms. As soon as the baseboard 30 reaches the position as illustrated in Fig. 2, it will have a tendency to drop flatly into contact with the top surface of the receiving platform 14. This is due to the fact that the air escaping from the valves will flow into the slots 31 and lift the paper from the board and acting in its flow into these slots 31 as an injector, thereby drawing the air from between the baseboard 30 and the top surface of the receiving platform 14.

In this manner, the baseboard 30 with the stacks of cut paper thereon is actually floated onto the receiving platform 14 by the air escaping or being discharged from the valve 20, and likewise, the paper is supported, or floated upon the current of air that flows through the slots 31 in the baseboard 30.

It should be here stated that the size and weight of the ball 25, the diameter of the bore 23 and the pressure of air in the chambers 12 and 13, are quite important, in that the pressure of air must be such that it will lift the ball 25 and hold it against the valve seat 24 when the baseboard is not on the receiving platform or a stack of paper on the transfer platform. Also, the flow of air from the valve, when restricted by the baseboard or stack of paper, must be sufficient to support them clear of the surface.

With such a construction, it is obvious that the baseboard 30 with the stack of paper thereon may be easily transferred from the cylindrical rollers 10 onto the receiving platform 14 and then the individual stacks of paper may be moved upon the transfer platform 15.

As illustrated in dotted outline in Fig. 1, as at 40, the conveyer chamber 13 may be extended in either direction, or from either end to any desired location for the transfer or conveyance of the paper.

In actual operation, thickness gauges have been used to determine the height or distance that the stack of paper is supported for held above the conveyer platform 15, and this has been found to be between 15 and 30 thousandths of an inch.

This clearance is ample to allow the stacks of cut paper to be easily moved by a manual operation over the surface of the conveyer to any desired point. Since this air is flowing or escaping from beneath the stack of paper, the movement of the stack will be quite easily accomplished.

By use of a conveyer system of this type of construction, the stacks of cut pulp or paper may be moved and the stack maintained in an even, regular pile, to a point where it will be bound or packed for shipment, or immediately used.

The advantages of such a transfer or conveyer system of mechanism are thought to be readily apparent to those familiar with this art.

While the invention herein disclosed is illustrated and described in one particular application, it may be applied and utilized in many other and various ways. It is therefore not intended that the invention be limited to the details of the disclosures made herein, but that it be given an interpretation commensurate to the spirit and scope of the invention disclosed.

Having thus described our invention, what we claim as new therein and desire to secure by Letters Patent is:

1. A conveyer of the character described, comprising, in combination, a bed plate provided with a plurality of air valves in connection with a source of air under pressure, a means for the conveyance of stacked material onto said bed plate, and a baseboard adapted for the support thereon of stacked material for conveyance by said means onto said bed plate, said valves being adapted to be opened by delivery of the baseboard and stacked onto the bed plate and said board having ports therethrough for the pas-

sage of air under pressure released by the valves to the base surface of a stack disposed on the board.

2. A conveyer of the character described, comprising, in combination, a horizontal bed plate provided over its area with air release valves in substantially close relationship and connected with a source of air under pressure, means for the delivery of stacked material onto the said bed plate, and a base board for the support of stacked material thereon for delivery by said means; said board being provided over its area with air passage therethrough, and said valves being normally closed and adapted to be automatically opened by the disposition of the baseboard and stack on the bed plate.

3. A conveyer as in claim 2, including a stop against which the baseboards, as delivered onto said bed plate, will be engaged to limit their travel and wherein the air passages of the base boards are so disposed as to be in registration with said open valves of the bed plate when the latter are engaged against the said stop.

4. A conveyer of the character described, comprising, in combination, a bed plate provided over its area with air release valves in substantially close relationship, opening therethrough and connected at the under side of the plate with a source of air under pressure; said plate being of two different sections of different horizontal level, separated by a vertical shoulder; means for the delivery of stacked material onto the area of lower level, and a base board for the support of stacked material thereon for delivery by said means, and provided over its area with air passages therethrough; said valves in the area of lower level being adapted to be opened by contact of the base board under weight of a stack thereon for the outflow of air under pressure to float the board and stack to position against said shoulder, and said air passages in the board being so located as to register with the open valves when the board is against said shoulder for application of air to the base of the stack to assist in its being disposed from the board to the bed plate area of higher elevation.

5. A conveyer as recited in claim 4 wherein the valves of said bed plate area of higher level are normally closed and are adapted to be automatically opened by contact therewith of the base surface of a stack of material delivered thereonto.

6. In a conveyer of the character described, a bed plate overlying and closing a chamber containing air under pressure, a valve housing opening through the plate, a ball seat in the upper end of the housing, a ball adapted to be seated thereagainst and, when seated, to project beyond the top surface of the bed plate, and a baseboard adapted to be moved across and to be disposed upon the bed plate for the depression of said balls to open position, and formed with air ports therethrough for passage of air released by said valves, to the top of the base board.

7. A conveyer as in claim 6 wherein the ports are arranged in said base board to register with the said valves, and are of lesser diameter than the diameter of the part of the valve balls exposed above the base plate.

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