

Sept. 3, 1935.

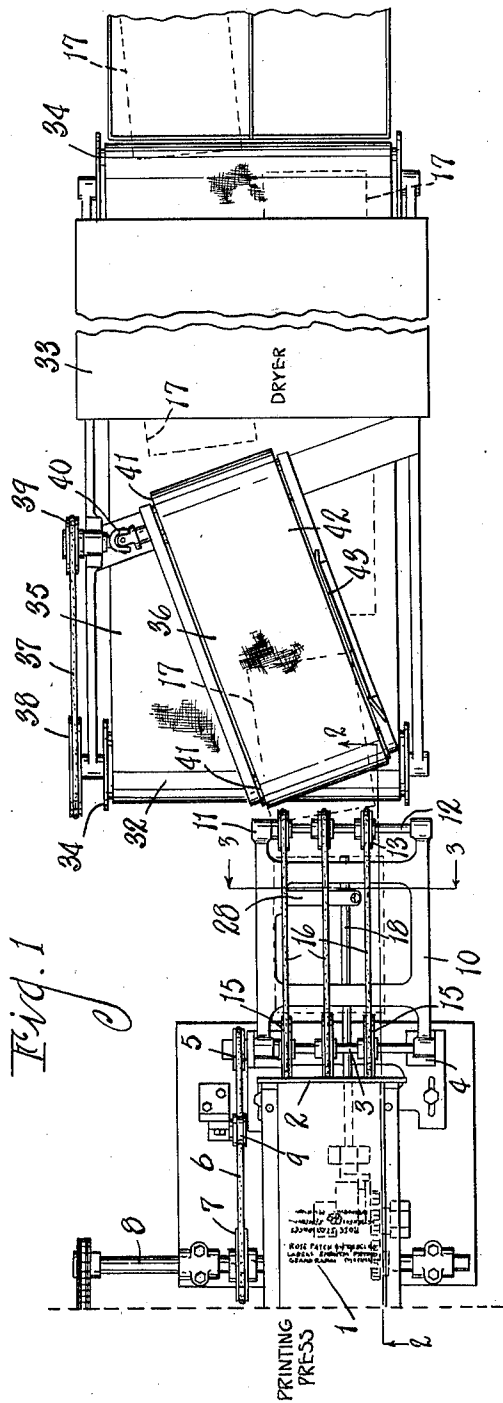
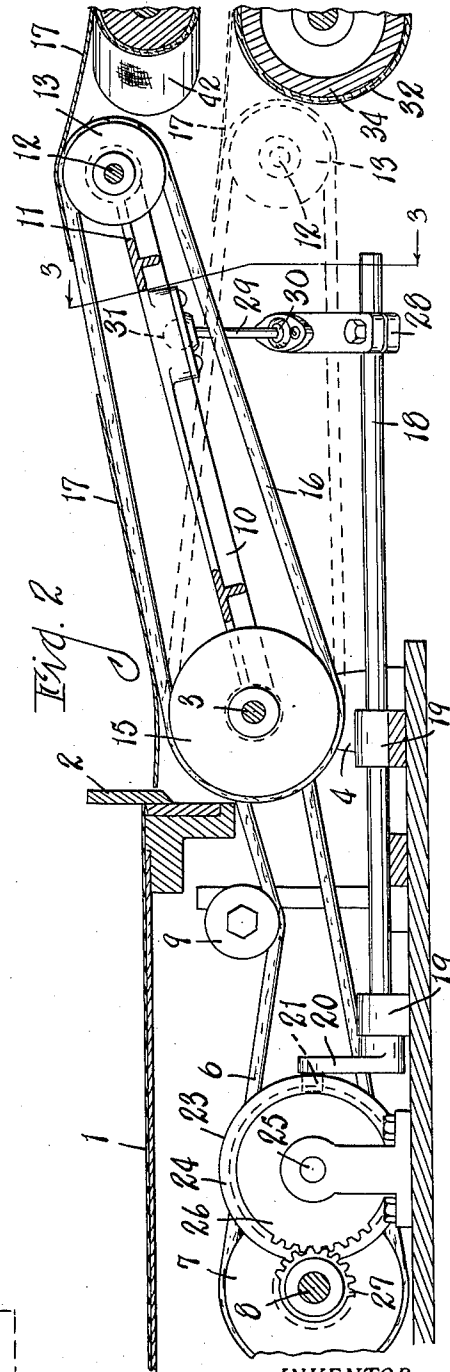
A. ROSENTHAL

2,013,220

SHEET SORTING MEANS

Filed Feb. 10, 1934

2 Sheets-Sheet 1



Arthur Rosenthal

BY

Chappell + Earl

ATTORNEYS

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2 Sheets-Sheet 2

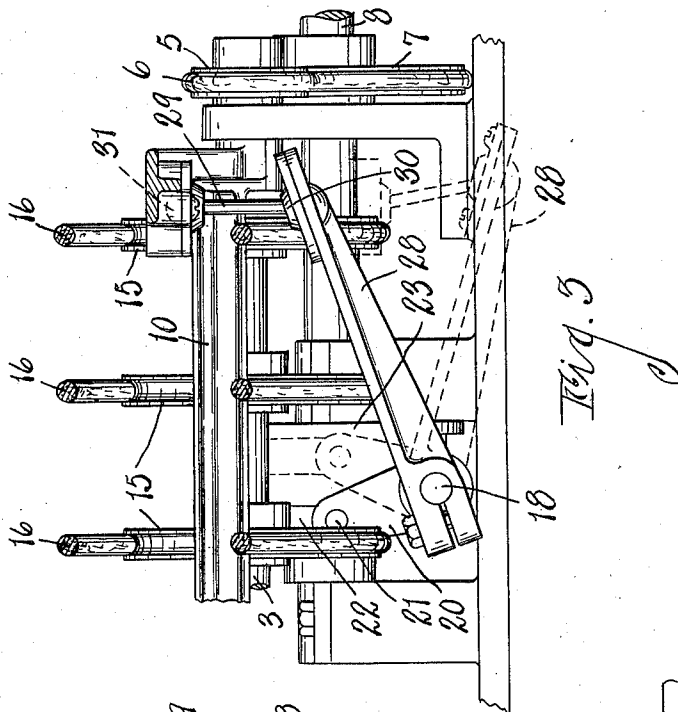


Fig. 5

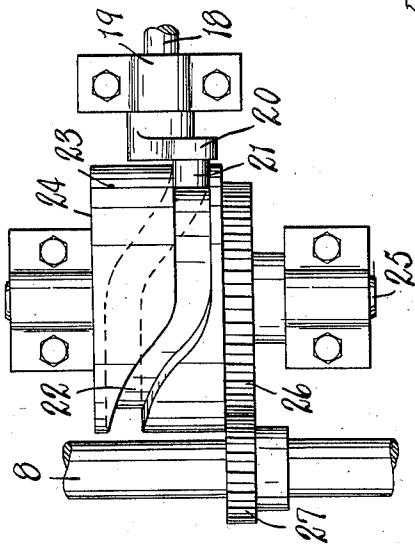
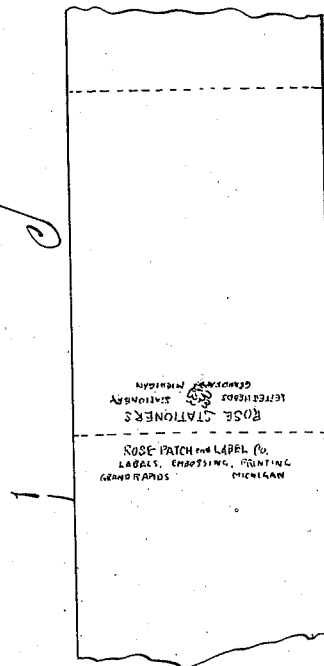


Fig. 4



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2,013,220

SHEET SORTING MEANS

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Application February 10, 1934, Serial No. 710,600

6 Claims. (Cl. 271-64)

This invention relates to apparatus for sorting letterheads or other engraved or printed sheets as they are delivered from printing presses, and is especially adapted to sorting and handling letterheads printed on a press such as is shown in my co-pending application Serial No. 661,796, filed March 20, 1933, for printing presses in which pairs of opposed letterheads are printed with a single operation of the press on a continuous roll of paper and the letterheads are then fed to a cut-off means and are delivered from the machine singly and unsorted in the order in which they are printed on the roll.

My invention has for its objects:

First, to produce an apparatus for sorting the letterheads or sheets as they are delivered from such a press so that they pass through a drier and are then delivered in stacks so that all similar letterheads are in a single stack, or, if two plates are used to print the same letterhead, the engraving on the letterheads of each stack lies in the same direction in the stack.

Second, to provide such an apparatus that is simple in construction and sure in operation.

Third, to provide such an apparatus that is run from the power plant of the printing press itself and can be easily synchronized therewith.

Other objects and advantages pertaining to details of construction and operation will appear from the description to follow. A preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view of my device showing letterheads being delivered from the press to the cutter and thence to the drier.

Fig. 2 is a sectional view taken on line 2-2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3-3 of Fig. 2.

Fig. 4 is a detail view of the cam for reciprocating the sorting conveyor.

Fig. 5 is a view of the strip of paper with opposed, different letterheads printed thereon.

The parts will be identified by their numerals of reference which are the same in all the views.

The printing press which corresponds to that of my co-pending application is indicated at the left of Fig. 1. The letterheads or other printed sheets passing from that machine are shown at 1, passing under the cut-off mechanism 2 which need not be described in detail. At the point of delivery of the letterheads is a driven shaft 3 journaled in brackets 4. This shaft is driven by a suitable pulley 5 keyed thereon and a belt 6 running to a pulley 7 keyed on a rotating shaft

which is part of the printing press and is driven by the power plant of the printing press. The belt is kept tight by an idler 9. A frame 10 is pivoted on the shaft 3 with one end 11 thereof free for up and down reciprocation as is indicated by the dotted lines in Fig. 2. A shaft 12 is carried by the free end of the frame and has thereon a plurality of pulleys 13 free for rotation. A plurality of pulleys 15 are mounted on the shaft 3 and are keyed or otherwise fastened thereon for rotation with the shaft as it rotates. A plurality of belts 16 join the pulleys 13 and 15 in pairs to form a continuous belt conveyor. The frame 10 being pivoted on the shaft 3, it is possible to reciprocate the end of this conveyor as indicated without interfering with the drive thereof and the single letterheads or sheets 17 are fed by the conveyor.

Below the conveyor is a shaft 18 journaled in supports 19 for reciprocation. This shaft bears a crank 20 having a crank pin 21 engaging a cam slot 22 on the cylindrical surface 23 of a rotating cylindrical cam 24 which is keyed or otherwise attached on the shaft 25 which is driven by a gear 26 driven by a pinion 27 mounted on the shaft 8. The cam slot 22 and the stud 21 cooperate to reciprocate the shaft 18. Affixed to the other end of shaft 18 is a crank 28. A rod 29 is connected to crank 28 by a universal joint connection 30 and this rod is connected to the frame 10 near its free end by a similar universal joint connection 31. The operation of the press drives the cam 24 which reciprocates shaft 18 and this in turn causes an up and down reciprocation of the end of the frame 10. This apparatus is timed to operate so that one up and down reciprocation of the end of the frame 10 occurs for each impression of the printing press and feeding of two letterheads, so that one letterhead is discharged at the top of the reciprocation of the frame and the next letterhead is discharged at the bottom position of the frame.

Directly at the end of this pivoted conveyor is located a continuous belt conveyor 32 passing through a drying hood 33 which may be of any desired construction. The conveyor 32 is provided with end rollers 34 on which the continuous belt runs and the web 35 thereof is of a width sufficient to carry two parallel rows of sheets or letterheads with the individual sheets arranged one behind the other as they are delivered from the reciprocating conveyor. The conveyor 32 is located to receive the letterheads of one row directly from the end of the reciprocating conveyor or frame 10 and the letterheads of this

row are those discharged at the bottom of the up and down reciprocating motion of the frame 10.

Above the conveyor 35 and at an angle thereto is a third continuous belt conveyor 35 driven by means of a chain or belt 37 operating on a pulley 38 on the end of the roll 34 and engaging a pulley 39 connected by universal joint connection 40 to a roll 41 over which the web 42 of the continuous belt conveyor 36 operates. The conveyor 36 is directly above the conveyor 32 and receives letterheads from the frame 10 at its upper position. At the side of the web 42 of conveyor 36 is a metal guide member 43 which projects above the web 42 and guides the letterheads on the belt 42 to the side of the conveyor 32 not occupied by the row of letterheads delivered from the frame 10 directly to the conveyor 32. This forms two parallel rows of letterheads and the identical letterheads are lined up in separate rows. The conveyor 32 carries the rows of letterheads through the drier and deposits them in piles at the discharge from this conveyor.

It will be understood that as the device operates the opposed letterheads are fed from the cutter 2 to the conveyor of the frame 10 and are alternately fed to the conveyor 32 or the conveyor 36. Those fed directly to the conveyor 32 pass as a row through the drier, while those fed to conveyor 36 eventually pass to conveyor 32 to form a second row.

Using the apparatus in a press in which opposed letterheads are printed, it is only necessary to sort the sheets into two rows and it is only necessary to provide two positions.

I have shown and described my invention in the form preferred by me, but wish to claim the same broadly as well as specifically, as pointed out in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. Sheet sorting means for use in conjunction with printing presses that print opposed or different sheets and deliver them singly, unsorted and in a definite order, comprising a driven shaft located at the point of delivery of said sheets from the press, a frame loosely pivoted on said shaft and having at its free end a shaft parallel to said driven shaft, a plurality of pulleys on each shaft and a plurality of belts connecting the pulleys of said shafts in pairs to form a continuous belt conveyor, means for driving said driven shaft from the press, means for causing up and down reciprocation of the free end of said frame timed to reciprocate once for each pair of sheets delivered from the press comprising a grooved cylinder cam, means for driving said cam from the printing press, a reciprocable shaft carrying a crank having a stud thereon cooperating with the groove of said grooved cam whereby said crank and shaft are reciprocated and carrying a second crank, a universal joint connection between said frame and said second crank, a second continuous belt conveyor of a width to convey two parallel rows of sheets with the individual sheets arranged one behind the other and positioned to receive sheets directly from said frame at its bottom position to form one of said rows of sheets, and a third continuous belt conveyor with a deflecting plate to steer sheets conveyed thereon at an angle to and driven from said second conveyor to receive sheets from said frame at its top position, and to deliver said sheets to said second conveyor to form a second row of

sheets, whereby identical sheets are all placed in the same row.

2. Sheet sorting means for use in conjunction with printing presses that print opposed or different sheets and deliver them singly, unsorted and in a definite order, comprising a driven shaft located at the point of delivery of said sheets from the press, a frame loosely pivoted on said shaft and having at its free end a shaft parallel to said driven shaft, a plurality of pulleys on each shaft and a plurality of belts connecting the pulleys of said shafts in pairs to form a continuous belt conveyor, means for driving said driven shaft, means for causing up and down reciprocation of the free end of said frame timed to reciprocate once for each pair of sheets delivered from the press comprising a grooved cylinder cam, means for driving said cam, a reciprocable shaft carrying a crank having a stud thereon cooperating with the groove of said grooved cam whereby said crank and shaft are reciprocated and carrying a second crank, a universal joint connection between said frame and said second crank, a second continuous belt conveyor of a width to convey two parallel rows of sheets with the individual sheets arranged one behind the other and positioned to receive sheets directly from said frame at its bottom position to form one of said rows of sheets, and a third continuous belt conveyor at an angle to said second conveyor to receive sheets from said frame at its top position, and to deliver said sheets to said second conveyor to form a second row of sheets, whereby identical sheets are all placed in the same row.

3. Sheet sorting means for use in conjunction with a single conveyor and with printing presses that print opposed or different sheets and deliver them singly, unsorted and in a definite order, comprising a driven shaft located at the point of delivery of said sheets from the press, a frame loosely pivoted on said shaft and having at its free end a shaft parallel to said driven shaft, a plurality of pulleys on each shaft and a plurality of belts connecting the pulleys of said shafts in pairs to form a continuous belt conveyor, means for driving said driven shaft, means for causing up and down reciprocation of the free end of said frame timed to reciprocate once for each pair of sheets delivered from the press, a second continuous belt conveyor of a width to convey two parallel rows of sheets with the individual sheets arranged one behind the other and positioned to receive sheets directly from said frame at its bottom position to form one of said rows of sheets, and a third continuous belt conveyor at an angle to said second conveyor to receive sheets from said frame at its top position, and to deliver said sheets to said second conveyor to form a second row of sheets, whereby identical sheets are all placed in the same row.

4. Sheet sorting means for use in conjunction with a single conveyor and with printing presses that print opposed or different sheets and deliver them singly, unsorted and in a definite order, comprising a continuous belt conveyor positioned at the point of delivery of said sheets from the press and having one end free for up and down reciprocation, means for driving said conveyor, means for causing up and down reciprocation of the free end of said conveyor timed to reciprocate once for each pair of sheets delivered from the press, a second continuous belt conveyor of a width to convey two parallel rows of sheets with the individual sheets arranged one

behind the other and positioned to receive sheets directly from said first conveyor at its bottom position to form one of said rows of sheets, and a third continuous belt conveyor at an angle to said second conveyor to receive sheets from said first conveyor at its top position, and to deliver said sheets to said second conveyor to form a second row of sheets, whereby identical sheets are all placed in the same row.

5 5. Sheet sorting means for use in conjunction with a single conveyor and with printing presses that print opposed or different sheets and deliver them singly, assorted and in definite order comprising a continuously feeding conveyor located at the point of delivery of sheets from the press and adapted to be reciprocated to deliver sheets therefrom alternately at two different points, means for reciprocating said conveyor timed to reciprocate once for each pair of sheets delivered from the press, a second conveyor of a width to convey two parallel rows of sheets with the individual sheets arranged one behind the other and positioned to receive sheets from said first conveyor at one point of delivery there-

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from to form one row of sheets on said second conveyor, and a third conveyor to receive sheets from said first conveyor at a second point of delivery therefrom and to convey said sheets to said second conveyor to form a second row of sheets thereon whereby identical sheets are all placed in the same row.

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6. Sheet sorting means for use in conjunction with a single conveyor and with printing presses that print opposed or different sheets and deliver them singly, unsorted and in definite order comprising a continuously feeding conveyor of a width to convey two parallel rows of sheets with the individual sheets arranged one behind the other, and means including a reciprocating conveyor adapted to support and convey the sheets from said press to laterally spaced points on said continuously feeding conveyor to form rows of sheets thereon, the reciprocation of said reciprocating conveyor being timed to deliver sheets alternately to the different points, whereby identical sheets are all placed in the same row.

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