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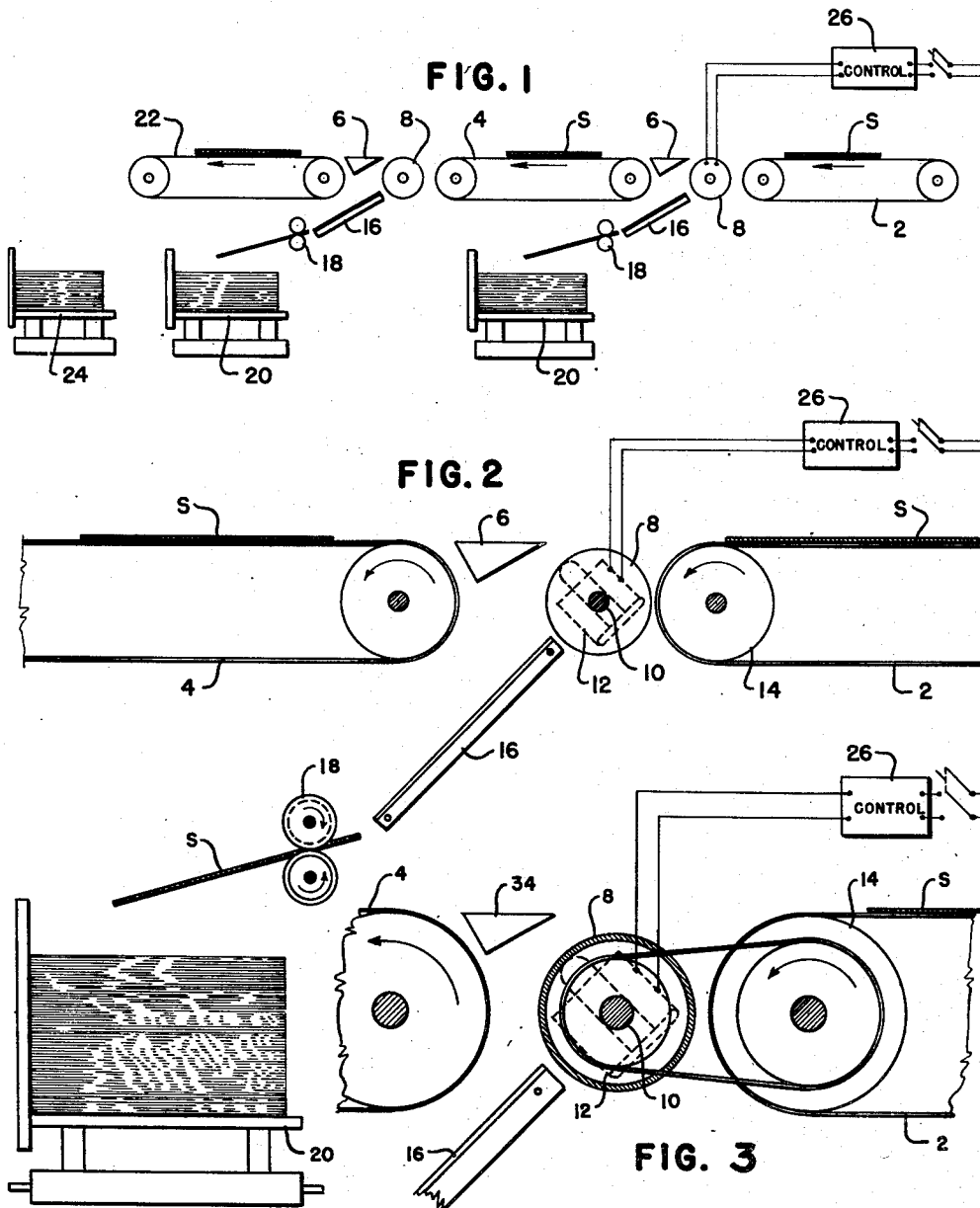
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2,660,318

APPARATUS FOR CONVEYING MAGNETIZABLE SHEETS

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2 Sheets-Sheet 1



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APPARATUS FOR CONVEYING MAGNETIZABLE SHEETS

2 Sheets-Sheet 2



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APPARATUS FOR CONVEYING MAGNETIZABLE SHEETS

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3 Claims. (Cl. 214-11)

1

This invention relates to apparatus for conveying magnetizable sheets and more particularly to the conveying of steel sheets. In the manufacture of tin plate it is necessary to inspect the sheets either visually by an inspector or, in the case of inspecting for pin holes, automatically by means of an electric eye. In either case, the sheets are inspected as they pass along a conveyor and the defective sheets are later deflected from the conveyor line into a reject pile or piles. This deflection is ordinarily accomplished by means of a pivotally mounted flap gate, the operation of which is controlled by a synchronous timing device which is preset to open the flap gate just as the selected sheet arrives in front of it. The flap gates which are mechanically operated up and down must be relatively heavy and of special shape and construction to facilitate passage of the reject to the pile below the belt and also be designed so that they will lie flat to permit easy passage of the prime sheets thereover. The flap gate, because of its relatively heavy weight, has awkward mechanism and moving parts which wear and cause trouble. Its operation is slow so that it is unsuitable for high speed production.

It is therefore an object of my invention to provide a sheet diverter which is simple and has no moving parts to start and stop for each operation.

This and other objects will be more apparent after referring to the following specification and attached drawings in which:

Figure 1 is a schematic view of the conveying apparatus embodying my invention;

Figure 2 is an enlarged view of a portion of Figure 1;

Figure 3 is a fragmentary view similar to Figure 2 and showing a detail;

Figure 4 is a view, similar to Figure 2, showing a second embodiment of my device; and

Figure 5 is a view of another embodiment.

Referring more particularly to the drawings, the reference numeral 2 indicates a belt conveyor over which a sheet S is passing. Spaced from the conveyor 2 is a second conveyor 4 which normally receives the sheet S from the conveyor 2. A stationary deflector 6 is arranged between the conveyors 2 and 4. A magnetizable roller 8 is arranged between the delivery end of conveyor 2 and the deflector 6. As shown in Figure 2, the roll 8 is provided with a shaft 10 to which is rigidly attached an electromagnet 12. The roll 8 is mounted for rotation about the shaft 10 and may be driven independently or from the conveyor roll 14 as shown in Figure 3. It will be

2

seen that the belt conveyor 2 together with the magnetizable roll 8 form a conveying mechanism for the sheets S. Extending downwardly at an angle from the roll 8 is a guide 16 which leads to a pair of driven pinch rolls 18. Adjacent the rolls 18 is a reject piler 20. If it is desired to have three classifications of sheets, a third conveyor 22 is arranged in line with conveyors 2 and 4, and a diverter 6, roll 8, guide 16, pinch rolls 18 and piler 20 are arranged between the conveyors 4 and 22 in the same manner as between conveyors 2 and 4. The prime sheets from the end of conveyor 22 are conveyed to the prime piler 24. The electromagnet 12 is selectively magnetized and demagnetized by a control 26 which may be started in operation either manually or automatically depending upon the type of inspection.

The operation of the device is as follows:

When the sheet S passing over the conveyor 2 is found to be defective the control 26 operates to magnetize the electromagnet 12 just as the sheet is approaching it. This causes the sheet to be diverted downwardly along the guide 16 to the pinch rolls 18 and hence to the reject piler 20. As soon as the sheet S passes from the roll 8, the control 26 demagnetizes the electromagnet 12. Hence any sheets being fed along conveyor 2 will continue along conveyors 4 and 22 to the prime piler 24. For high speed operation it is desired to rotate the roll 8 at a greater peripheral speed than the speed of conveyor 2 so that the sheet S will be moved out of the way of succeeding sheets.

Figure 4 shows a slightly different embodiment of my device. In this modification a conveyor roll 28 is mounted for rotation about a shaft 30 and an electromagnet 32 is rigidly mounted on the shaft 30. It will be seen that the conveyor 2 together with the conveyor roll 28 form a conveying mechanism corresponding to the conveying mechanism of Figures 1 to 3. A stationary sheet diverter 34 is mounted between the conveyors 2 and 4. A guide 16, pinch rolls 18, and reject piler 20 are arranged in the same manner as in Figure 1. The operation of this device is the same as that shown in Figures 1 to 3 with the roll 28 taking the place of roll 8.

Figure 5 shows another embodiment of my device in which a conveyor roll 36 is mounted for rotation about a shaft 38 and an electromagnet 40 is rigidly mounted on the shaft 38. It will be seen that the conveyor 2 together with the conveyor roll 36 form a conveying mechanism corresponding to the conveying mechanism of

3

Figures 1 to 3. The electromagnet 40 extends over a considerable arc as compared to electromagnet 32. A guide 42 extends downwardly from the roll 36 to a conveyor 44 which delivers the sheets to a reject piler (not shown). The operation of this device is essentially the same as that shown in Figure 4.

While several embodiments of my invention have been shown and described, it will be apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. Apparatus for conveying magnetizable sheets comprising two conveyors spaced apart in tandem over which the sheets travel, a stationary deflector between the conveyors over which the sheets pass in traveling from one conveyor to the other, a rotatable magnetizable roll between the first conveyor and the stationary deflector, a guide adjacent said magnetizable roll extending downwardly therefrom, and means for magnetizing and demagnetizing said roll, said means being operative to magnetize said roll to deflect a sheet from the path of travel between the conveyors downwardly between said roll and the underside of said deflector over said guide, said means being operative to demagnetize said roll after the diverted sheet passes therefrom.

2. Apparatus for conveying magnetizable sheets comprising two conveyors spaced apart in tandem over which the sheets travel, a stationary deflector between the conveyors over which the sheets pass in traveling from one conveyor to the other, a rotatable magnetizable roll on the side of said deflector away from the second of said conveyors, a reject piler below the second of said conveyors, a guide adjacent said magnetizable roll extending downwardly therefrom

4

to said piler, and means for magnetizing and demagnetizing said roll, said means being operative to magnetize said roll to deflect a sheet from the path of travel between the conveyors downwardly between said roll and the underside of said deflector over said guide to said piler, said means being operative to demagnetize said roll after the diverted sheet passes therefrom.

3. Apparatus for conveying magnetizable sheets comprising a first conveying mechanism including a magnetizable roll at the exit end thereof, a second conveying mechanism spaced from the exit end of the first conveying mechanism, a stationary deflector between the conveying mechanisms over which the sheets pass in traveling from one conveying mechanism to the other, a guide adjacent the exit end of the first conveying mechanism extending downwardly therefrom, means for magnetizing and demagnetizing said roll, said means being operative to magnetize said roll to deflect a sheet from the path of travel between the conveying mechanisms downwardly between said roll and the underside of said deflector over said guide, said means being operative to demagnetize said roll after the diverted sheet passes therefrom.

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