June 14, 1955 G. B. HALL 2,710,684

ANTI-DUMPING DEVICE FOR BUNDLES OF COILED WIRE

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FIG. 1.

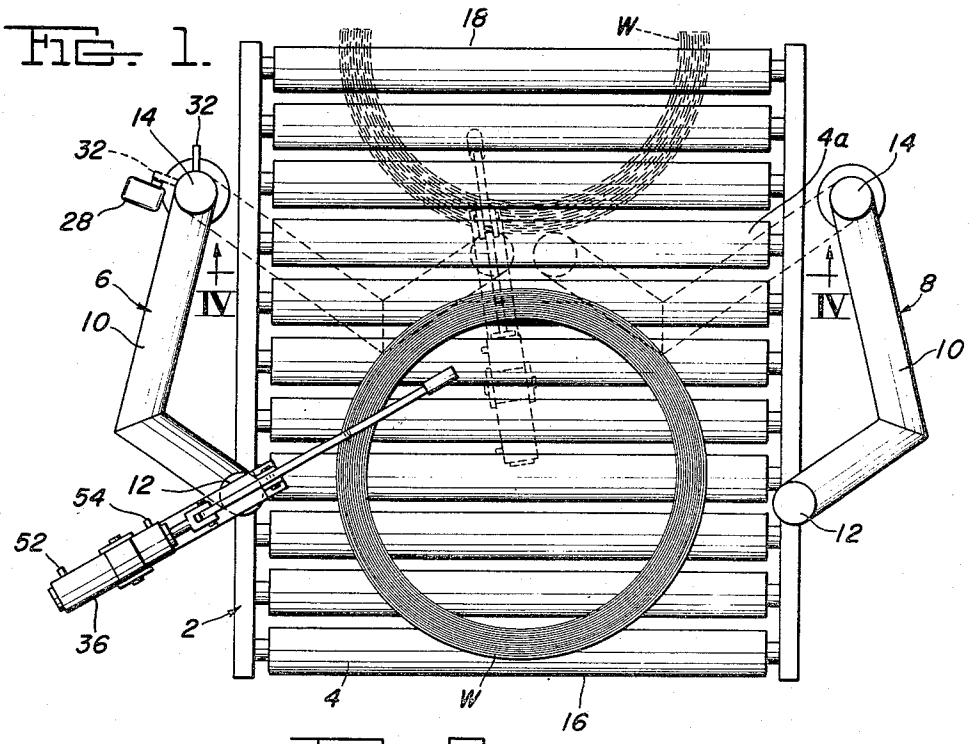
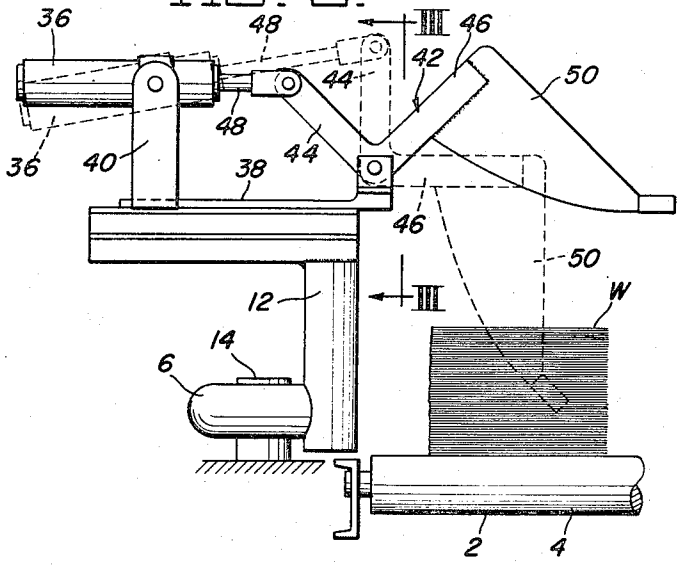


FIG. 2.



INVENTOR:
GEORGE B. HALL,

BY: Donald G. Dalton
his Attorney.

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FIG. 3.

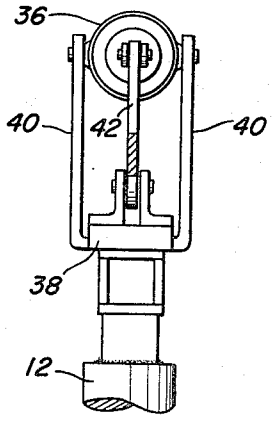


FIG. 4.

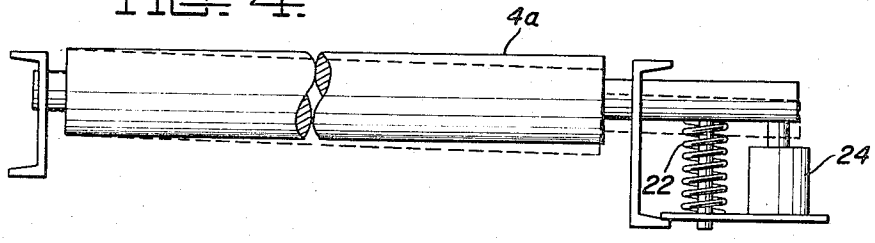
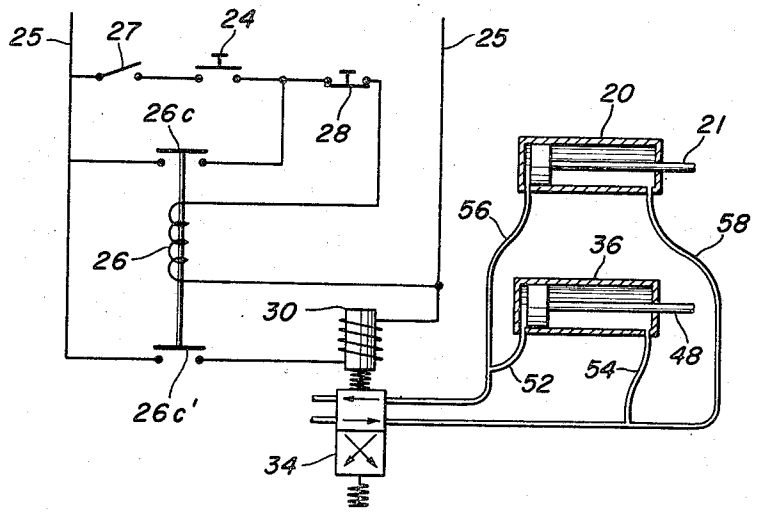


FIG. 5.



INVENTOR:
GEORGE B. HALL,
BY: Donald G. Dalton
his Attorney.

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ANTI-DUMPING DEVICE FOR BUNDLES OF COILED WIRE

George B. Hall, Concord, Calif.

Application January 29, 1954, Serial No. 406,965

4 Claims. (Cl. 198—218)

The present invention relates generally to material handling apparatus and more particularly to a coil anti-dumping device especially suitable for use in conjunction with a conveyor.

Prior to my invention, much difficulty was encountered in the handling of unbound annular bundles of filament material such as metal wire due to the bundles "dumping" or spilling out of shape as they were moved along a conveyor. Such "dumping" resulted in irregularly shaped coils which were difficult or impossible to package and strap in a manner suitable for shipment. It was usually necessary for a workman to reshape each dumped coil before any strapping operation could take place. The ill effects of coil spilling became particularly acute with the introduction of high-speed automatic strapping machines. The latter were ordinarily provided with a roller conveyor table from which unbound bundles of wire or the like were fed into an automatic strapping mechanism by means of sweep arms which functioned in conjunction with the conveyor and strapping mechanism. The advantages of the automatic strapping operation were reduced considerably or eliminated altogether due to the frequent interruptions occasioned by the reshaping of spilled coils.

It is, accordingly, an object of my invention to provide a device adapted to stabilize and prevent spilling of an annular bundle of coiled material as it travels along a conveyor or similar bundle-transporting means.

The nature of the invention and its distinguishing features and advantages will be fully apparent from the following detailed disclosure and the appended claims when read in connection with the accompanying drawings in which:

Figure 1 is a plan view showing the invention installed on a roller conveyor;

Figure 2 is a side elevational view;

Figure 3 is a vertical sectional view taken on the line III—III of Figure 2;

Figure 4 is a sectional view taken on the line IV—IV of Figure 1 showing the details of the spring supported roll of the conveyor; and

Figure 5 is a diagrammatic illustration of the electrical and hydraulic system of the invention.

Referring more particularly to the drawings, reference numeral 2 designates a conventional roller conveyor table made up of a plurality of freely rotatable rolls 4. Two sweeps 6 and 8 are mounted adjacent the conveyor 2, one at each side thereof. Each of the sweeps 6 and 8 has a horizontal arm 10 with a vertical portion 12 extending upwardly from one end thereof. The other end of each arm is attached to a pivot member 14 at a point intermediate the ends of the conveyor. The sweeps 6 and 8 are moved simultaneously in an arc across the surface of the conveyor to move an article from the receiving end 16 of the table into a processing, such as a strapping mechanism (not shown), located adjacent the discharge end 18 of the table by means of a fluid cylinder 20 having its piston rod 21 operatively associated with both of

the arms 10 through conventional connections (not shown).

The conveyor roll designated 4a is supported at one end by a helical spring 22 and is arranged to trip a limit switch 24 when depressed by a load passing thereover. The limit switch 24 is connected across power leads 25, 25 in series with a relay coil 26, toggle switch 27 and a limit switch 28. Relay coil 26 is provided with normally open contacts 26c and 26c'. Contacts 26c are connected in parallel with switches 24 and 27. Contacts 26c' are connected in series with a solenoid 30. A protuberance 32 on one of the pivot members 14 is so arranged that it will trip the switch 28 when the sweeps 6 and 8 reach the end of their forward movement. The solenoid 30 is connected with and actuates a spring-return, four-way fluid valve 34 which controls flow of fluid to cylinders 20 and 36.

All of the above described structure is conventional with the exception of the fluid cylinder 36.

A base 38 is welded or otherwise attached to the top surface of the vertical portion 12 of the sweep 6. A pair of spaced upstanding brackets 40 are rigidly mounted adjacent one end of the base 38 and pivotally support the cylinder 36 therebetween. A bell-crank lever 42 having arms 44 and 46 is pivotally mounted on the end of the base 38 remote from brackets 40 with the free end of arm 44 pivotally connected to the piston rod 48 of cylinder 36. A coil stabilizing arm 50 is fastened to and extends downwardly at right angles from the free end of the arm 46 toward the conveyor 2. The coil stabilizing arm is so arranged that it will enter the eye of a bundle of wire W disposed upon the conveyor when the piston rod 48 is thrust forward and the arm 46 of the bell-crank lever 42 is moved to a horizontal position. Pressure fluid is supplied to opposite sides of the piston in cylinder 36 through flexible conduits 52 and 54 which are connected to usual fluid supply lines 56 and 58, respectively, extending between valve 34 and cylinder 20.

The operation of the device is as follows:

The switch 27 is closed to permit operation of the electrical and fluid circuits. When a bundle of wire W strikes roll 4a, limit switch 24 is closed, thus completing a circuit through relay coil 26. This closes contacts 26c and 26c'. Closing of contacts 26c seals in the coil 26 to prevent deenergization thereof when the bundle W leaves roll 4a. Closing of contacts 26c' completes a circuit through solenoid 30 which actuates valve 34 causing fluid to flow through conduits 52 and 56 to the left ends of cylinders 20 and 36, as shown in Figure 5, from fluid supply line 60 and permits discharge of fluid through line 62. Movement of piston rod 21 to the right causes the sweeps 6 and 8 to move out and push the bundle W along the conveyor. At the same time, movement of piston rod 36 to the right causes arm 50 to enter the eye of the bundle as shown in dotted lines in Figure 2. The stabilizing arm remains positioned within the bundle while it is moved along the conveyor and thus prevents the bundle from dumping or spilling. When the sweeps have reached the end of their forward movement, as shown in dotted lines in Figure 1, the normally closed limit switch 28 is opened by engagement with the protuberance 32, thus opening contacts 26c and 26c'. Opening of contacts 26c' deenergizes solenoid 30, which causes return of the valve 34 to the position shown in Figure 5. With the valve 34 in this position, fluid flows from line 62 through conduits 54 and 58, thus causing sweeps 6 and 8 and arm 50 to return to their original positions.

If desired, more than one roll 4 may be spring mounted and provided with a limit switch similarly to roll 4a so that various diameter bundles may be handled on the conveyor. When more than one roll 4 is spring mounted and provided with a limit switch, each of these rolls is

provided with a manually operated switch similar to switch 27 connected in series with each limit switch so that the rolls may be put into use selectively.

While one embodiment of my invention has 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. In a roller conveyor having a sweep arm pivotally mounted along the side thereof, said sweep arm including a vertical portion adapted to contact and move an annular bundle of wire along the conveyor, the improvement therewith of a bell-crank lever pivotally mounted on said vertical portion, a stabilizing arm attached to and extending angularly from the free end of one of the arms of said bell-crank lever toward said roller conveyor, a pressure cylinder having a piston rod projecting therefrom pivotally mounted on said vertical portion adjacent said bell-crank lever, means pivotally connecting said piston rod to the free end of the other arm of said bell-crank lever whereby movement of said piston rod is effective to move said stabilizing arm into and out of the core of said bundle of wire while the same is moved along said conveyor, first means on said conveyor responsive to a position of said bundle of wire on said conveyor for actuating said cylinder to extend said piston rod to move said stabilizing arm into the core of said bundle, and second means on said conveyor spaced from said first means responsive to a position of said bundle on said conveyor for actuating said cylinder to move said stabilizing arm out of the core of said bundle.

2. In a roller conveyor the improvement therewith as defined by claim 1 characterized by said first means including a limit switch responsive to pressure on at least one roller of said conveyor by said bundle of wire, a pressure fluid supply line connected with said pressure cylinder, and a solenoid operated valve in said supply line for controlling the flow of pressure fluid therethrough, said limit switch being connected with and adapted to actuate said solenoid operated valve, and said second means including a limit switch mounted on said conveyor in the path of said bundle of wire, said last named limit switch being connected with and adapted to actuate said solenoid operated valve.

3. In a roller conveyor for conveying an article having a generally vertical eye in the center thereof and having a sweep arm pivotally mounted along the side thereof for movement in a generally horizontal plane, said sweep arm including a generally vertical portion adapted to contact the outer surface of said article and move it along the conveyor, the improvement therewith of a bell-crank lever mounted on said vertical portion for pivoted movement in a generally vertical plane about a generally horizontal axis located a substantial distance above the top of said article, a stabilizing arm attached to and extending angularly from the free end of one of the arms of said bell-crank lever toward said roller conveyor, and means attached to the free end of the other arm of said bell-crank lever effective to move said stabilizing arm toward and away from said conveyor into and out of the eye of said article while the same is moved along said conveyor.

4. In a roller conveyor for conveying an article having a generally vertical eye in the center thereof and having a sweep arm pivotally mounted along the side thereof for movement in a generally horizontal plane, said sweep arm including a generally vertical portion adapted to contact the outer surface of said article and move it along the conveyor, the improvement therewith of a bell-crank level mounted on said vertical portion for pivoted movement in a generally vertical plane about a generally horizontal axis located a substantial distance above the top of said article, a stabilizing arm attached to and extending angularly from the free end of one of the arms of said bell-crank lever toward said roller conveyor, a pressure cylinder having a piston rod projecting therefrom pivotally mounted on said vertical portion adjacent said bell-crank lever, means pivotally connecting said piston rod to the free end of the other arm of said bell-crank lever whereby movement of said piston rod is effective to move said stabilizing arm toward and away from said conveyor into and out of the eye of said article while the same is moved along said conveyor.

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