

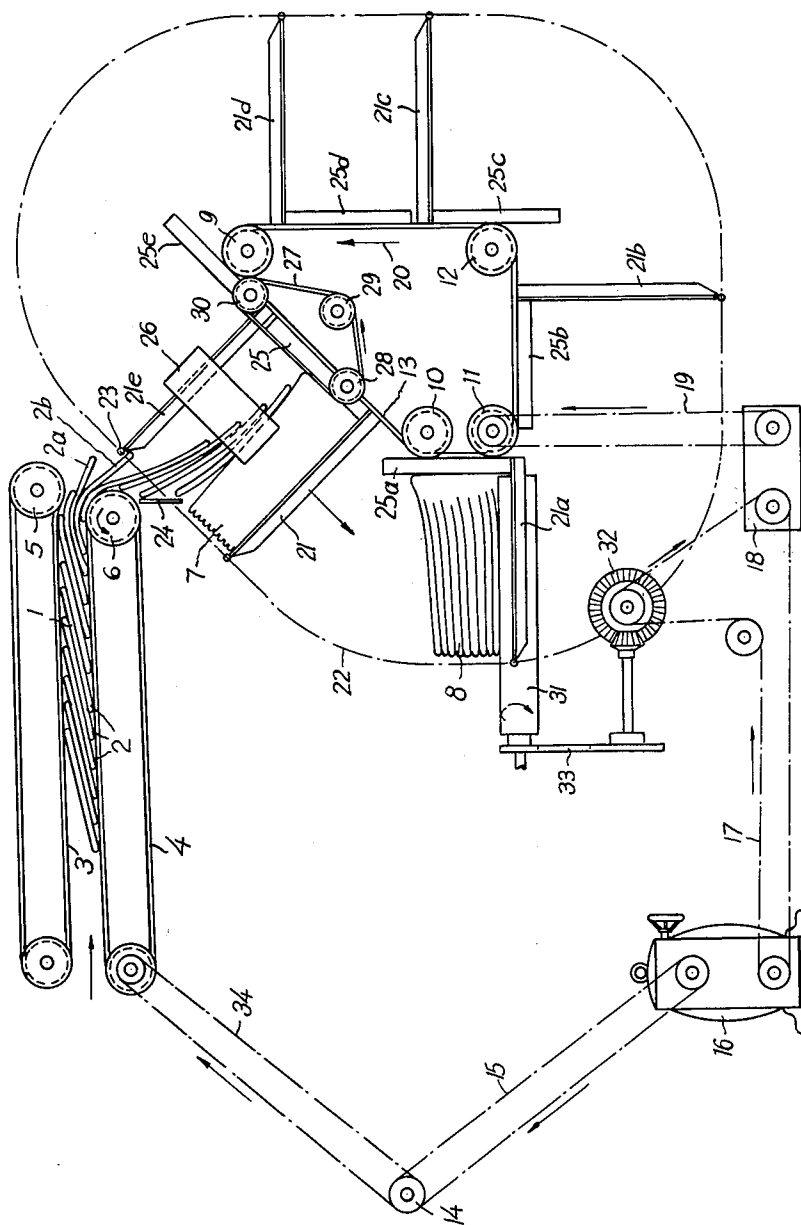
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H. B. NILSSON

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APPARATUS FOR STACKING NEWSPAPERS AND THE LIKE

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INVENTOR.

HERMAN BERTIL NILSSON

BY

Irwin J. Thompson

ATTY.

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APPARATUS FOR STACKING NEWSPAPERS AND THE LIKE

Herman Bertil Nilsson, Solna, Sweden, assignor to AB Bonnierforetagen, Stockholm, Sweden, a corporation of Sweden

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6 Claims. (Cl. 214—6)

This invention relates to an apparatus for stacking newspapers and the like. The newspapers are advanced in the form of a continuous stream by means of a conveyor. Hitherto this stream has been divided manually into suitable piles or stacks.

The object of the invention is to provide an apparatus for mechanical stacking of newspapers so that the workmen required for manual stacking can be set to work at other jobs and the stacking capacity can be considerably increased.

In its broadest aspect, the invention is characterized by an endless conveyor which at regular interspace is provided with a plurality of supports projecting outwards from the plane of the conveyor, the free ends of the supports being adapted at a certain part of their path of movement to engage the stream of newspapers such as to cause a certain number of newspapers to be stacked on each support prior to the engagement of the next following support with the stream of newspapers. According to a preferred embodiment, the conveyor is combined, at the place where it receives newspapers from the stream of newspapers, with an actuator belt provided in such a manner between the lateral edges of the conveyor that the lower edges of the newspapers which fall down on the conveyor edgewise with respect to the conveyor plane are caused to rest on the actuator belt at least along part of the path of the conveyor, said actuator belt being driven in the same direction as, but at a higher speed than the conveyor whereby to prevent the lower edges of the stacked newspapers from sliding back.

A suitable embodiment of the invention is diagrammatically illustrated by way of example in the annexed drawing.

Numerals 1 denotes a stream of newspapers 2 which as shown suitably overlap each other. The stream of newspapers is advanced by means of a conveyor consisting of an upper and a lower endless conveyor belt 3 and 4, respectively, which at the discharge end of the conveyor run around turning pulleys 5 and 6, respectively. In the embodiment illustrated, the conveyor 3, 4 is substantially horizontally disposed, but it may obviously make an angle with the horizontal plane.

At the discharge end of the conveyor the stream of newspapers is moved over to an apparatus for stacking or piling the newspapers in stacks 7, 8. This apparatus is mounted on a frame, not shown, in which there are mounted guide pulleys 9, 10, 11 and 12 for an endless conveyor 13. Preferably, this conveyor consists of two parallel lateral belts or chains which are suitably spaced apart and driven by the pulley 11 which is connected to the drive wheel 14 of the apparatus. The transmission between the wheel 14 and the pulley 11 comprises a chain 15, a variable change-speed gear 16, a chain 17, a change-speed gear 18 for the conveyor 13, and a chain 19 between the change-speed gear 18 and the pulley 11. As will be seen from the drawing, the conveyor 13 is sloping down in the direction of movement 20 between the pulleys 9 and 10.

In order to divide the stream of newspapers into piles or stacks, the conveyor 13 is provided with supports 21, 21a-21e which project outwards from the conveyor belts

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or chains and the free ends of which move along the path indicated by the chain-dotted line 22. In the position of operation shown, the supply of newspapers to the stack 7 is finished due to the fact that the support 21e engages the stream of newspapers at the point 23 consisting of rotatably mounted small wheels. Consequently, at this point the stream of newspapers is divided such that the newspaper 2b will be the top paper in the stack 7, whereas the newspaper 2a will be the lowermost paper in the stack which upon continued operation will be built up on the support 21e. When the free end of the support 21e strikes the newspaper 2b, this newspaper has not completely left the stream of newspapers, part of it being still between the pulleys 5 and 6. To guide the downwardly sliding newspapers to the stack 7 there is provided a guide plate 24 which is disposed below the pulley 6 and along which the upper edges of the newspapers slide downwards. As will be seen from the drawing, the newspapers place themselves edgewise with respect to the conveyor 13.

The supports 21, 21a-21e form parts of bolsters which are connected to both lateral belts of the conveyor and each of which consists of longitudinal bottom parts connected to the appertaining lateral belts, the nearest bottom parts as viewed in the drawing being denoted at 25 and 25a-25b. Each support 21 is connected to the leading end of the bottom parts 25 and forms a connection between the bottom parts 25.

In the embodiment illustrated, each support consists of two arms projecting at right angles from the appertaining bottom part and adapted to carry a stack. Between the outer ends of the arms there may be provided a long and narrow roller to facilitate division of the stream of newspapers at the point 23. Provided on either side of the conveyor 13 are vibration plates 26 for aligning the newspapers of the stack 7.

In order to prevent the lower edges of the newspapers from sliding back during the stacking operation, there is provided an endless actuator 27 between the lateral belts of the conveyor 13 at the place where the newspapers fall down on the individual bolsters 21, 25. The actuator consists of an endless belt which runs over rollers 28, 29 and 30. The upper side of the actuator belt located between the rollers 28 and 30 is located somewhat above the upper sides of the longitudinal bottom parts 25 such that the lower edges of the newspapers falling down will rest on the actuator belt 27 at least during the stacking operation. The actuator belt is driven in the same direction as, but at a higher speed than, the lateral belts 13, so that during the stacking operation the lower edges of the newspapers will be moved together in the direction towards the support 21.

After a stack has been completed, the bolster moves down to a roller conveyor 31 where the arms of the supports pass down between the rollers of the roller conveyor so as to deliver the stack or pile 8 of newspapers to the roller conveyor which removes the stack for further treatment.

The roller conveyor 31 is driven by the chain 17, a toothed gear 32 and a chain gear 33. The conveyor 3, 4 for the stream of newspapers is driven by the wheel 14 and a chain 34.

By varying the relative speeds of the conveyors 3, 4 and 13 it is easily possible to obtain a desired number of newspapers in each stack.

What I claim is:

1. An apparatus for stacking newspapers and the like comprising a first conveyor extending substantially horizontally and including upper and lower endless belts for advancing a continuous stream of overlapping papers between the facing portions of said two endless belts to a discharge end of said first conveyor, a second conveyor mounted adjacent the discharge end of said first conveyor

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and having an inclined paper receiving portion facing said discharge end and located at a lower level so that papers leaving said discharge end will fall down onto said receiving portion, said second conveyor having a plurality of stacking supports located at spaced intervals along said second conveyor and including projecting members to form stacking pockets for receiving a predetermined number of newspapers in each pocket, said projecting members having their outer ends located to move along a path which passes adjacent the discharge end of said first conveyor at such a distance therefrom that said outer ends will engage the stream of overlapping newspapers between two succeeding papers when they are still held between said two belts of said first conveyor and while their leading edge portions are projecting freely out from said discharge end to divide and divert the stream of overlapping newspapers, to the succeeding stacking support; means for driving said second conveyor in a direction so that its inclined receiving portion will move downwardly in synchronism with the drive of said first conveyor, an actuator belt mounted parallel with said receiving portion of said second conveyor to receive the leading edges of the newspapers and carry them along part of the path of said second conveyor, said actuator belt being driven in the same direction as, but at a higher speed than, said second conveyor in order to prevent the leading edges of the stacked papers from sliding back, and a receiving means mounted in a substantially horizontal direction in the path of movement of said second conveyor to receive the stacks of newspapers from said stacking supports.

2. An apparatus according to claim 1 wherein said second conveyor includes at least two lateral spaced apart belts, each support includes at least two longitudinal bottom parts, each bottom part connected with one of the lateral belts, said projecting members being disposed at

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the leading ends of each of the bottom parts and projecting therefrom at substantially right angles so as to form carriers for the newspapers.

3. An apparatus according to claim 1 in which the outer ends of the projecting members have mounted thereon a roller adapted to facilitate division of the stream of newspapers during engagement therewith of the projecting members.

4. An apparatus according to claim 1 wherein said receiving means includes a roller conveyor so that the individual stacks of newspapers are automatically delivered from the supports of the second conveyor to the roller conveyor.

5. An apparatus according to claim 1 wherein the driving means for the first conveyor for advancing the stream of newspapers and for the second conveyor having the supports have selectively synchronized means so that the number of newspapers in each stack is variable by suitable variation of the relative speeds of the driving means.

6. An apparatus according to claim 1 in which a guide plate is disposed at the discharge end of said first conveyor and said second conveyor to guide the continuous stream of newspapers from said first conveyor onto the stacking supports so that the newspapers place themselves edgewise with respect to said second conveyor.

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