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[56] **References Cited**
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 2,970,364 2/1961 Friedel 28/1(CL)
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FOREIGN PATENTS
 1,243,035 8/1960 France 226/108

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[54] **MACHINE FOR CROSSWISE DEPOSITION OF
 CARDED WEBS AND A CARDED WEB
 MANUFACTURED BY MEANS OF THE MACHINE**
 4 Claims, 5 Drawing Figs.

[52] U.S. Cl. **226/108,**
 28/1; 19/155; 226/119
 [51] Int. Cl. **B65h 54/76**
 [50] Field of Search 28/1(CL),
 1(SM); 19/155; 226/108, 113, 118, 119;
 270/(Inquired)

ABSTRACT: A machine for crosswise deposition of carded webs and the like which are advanced on a feeder belt onto a continuously driven discharge belt. This latter belt is positioned below the feeder belt and travels in a direction essentially at right angles to the direction of movement of the feeder belt. The machine also comprises two conveyor belts interposed between the feeder belt and the discharge belt and these two belts are driven at the same speed and at a constant tension. Means are provided to advance the carded web on these conveyor belts under forced guidance such that said carded web is deposited on the discharge belt evenly and without formation of folds.

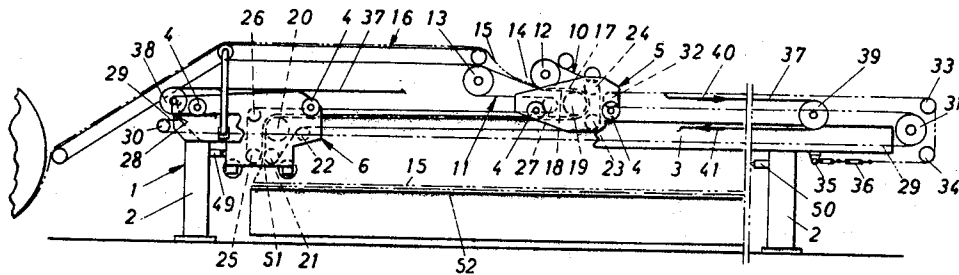


Fig.1

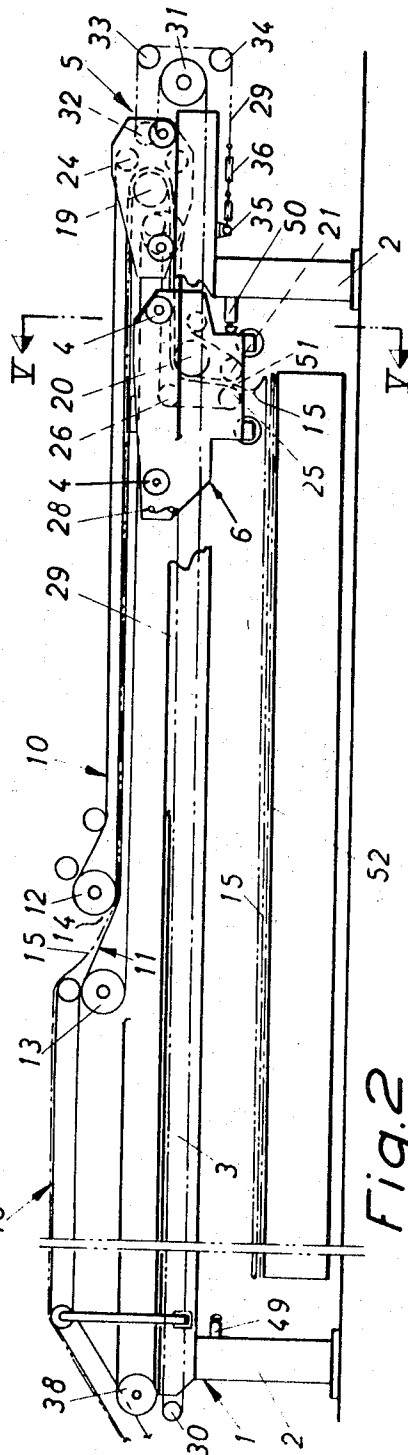
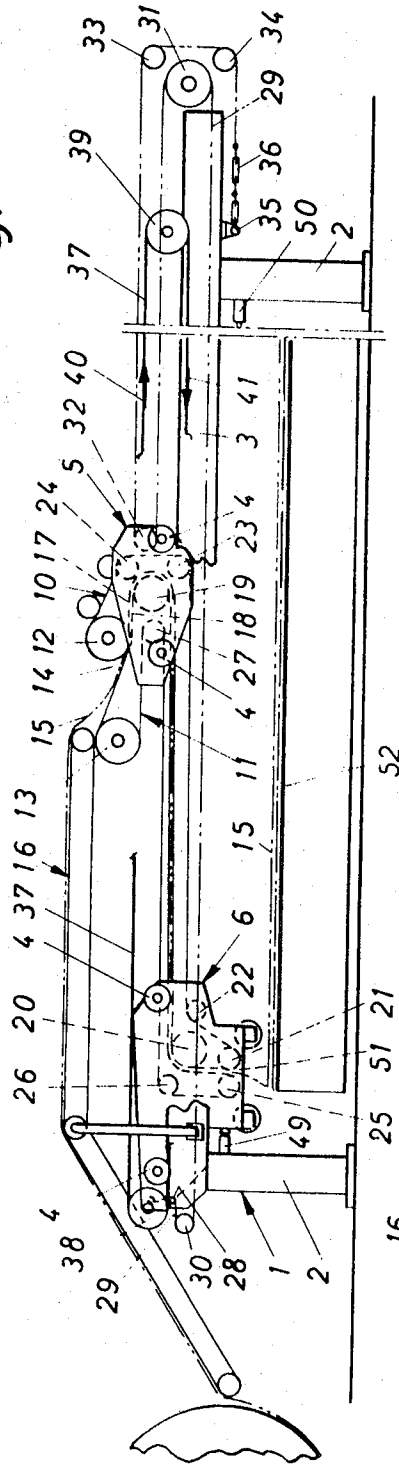
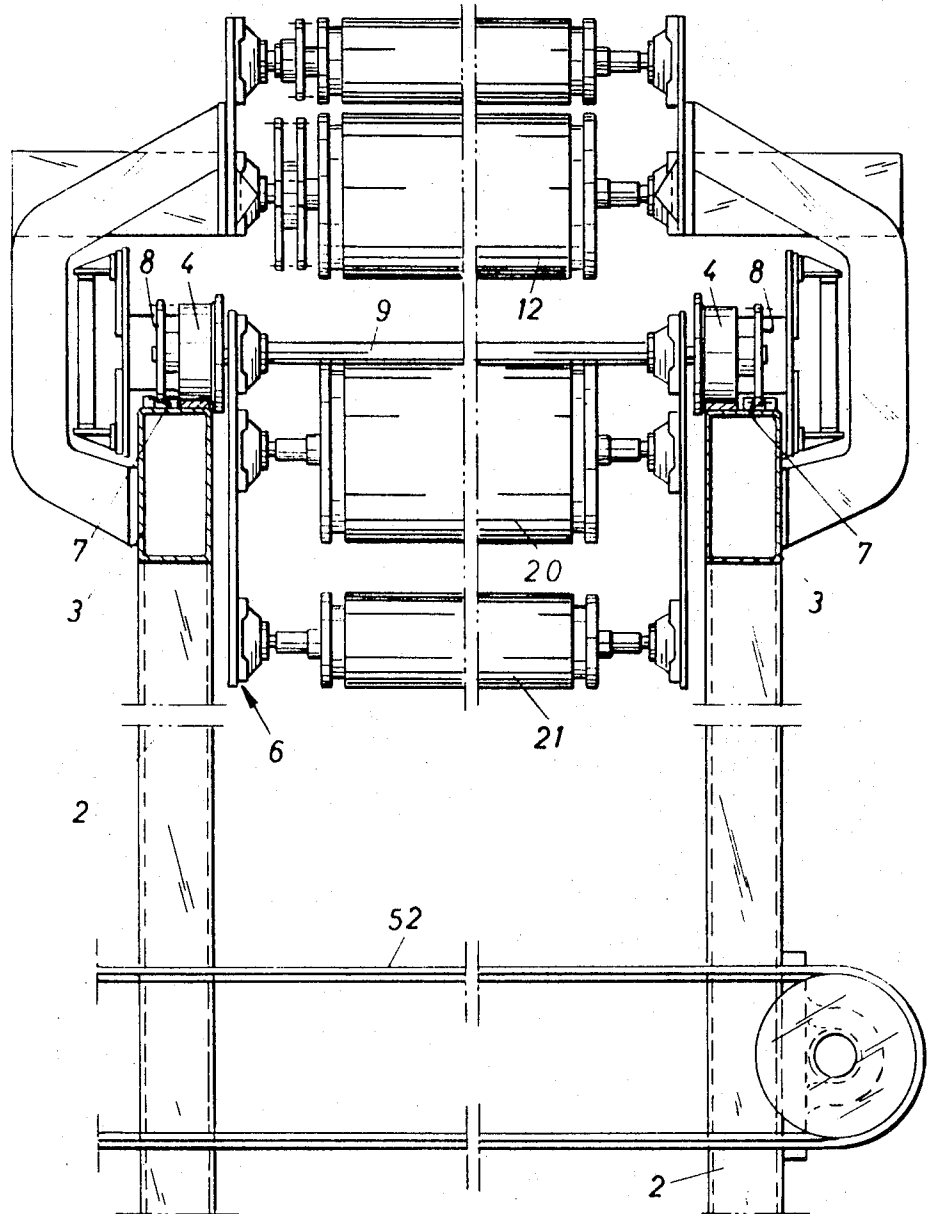


Fig.2

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Fig. 5



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MACHINE FOR CROSSWISE DEPOSITION OF CARDED WEBS AND A CARDED WEB MANUFACTURED BY MEANS OF THE MACHINE

BACKGROUND OF THE INVENTION

Such machines for crosswise deposition of carded webs are presently available on the market function in accordance with the following principle of deposition. A feeder belt carries carded webs down onto the conveyor belt on a first carriage which is arranged to perform a reciprocating movement and transfers the carded webs onto the conveyor belt on a second reciprocating carriage, situated at a lower level than the first one, above a discharge belt which is movable at right angles relatively said carriages and onto which the carded webs are deposited in the form of bats. It is the second carriage with its conveyor belt that performs the depositing work proper. The carriages are driven so as to perform a reciprocating movement between adjustable end positions. The first carriage which is connected to the second carriage in some suitable manner and follows it in the same directions of movements but at half its speed serves as an intermediate station. The speed of the conveyor belt on the upper carriage must be higher when the carriage is moving in the opposite direction relatively its conveyor belt than when the directions of movement are the same. To avoid that folds are formed in the carded webs and in the finished bats during the web deposition it is necessary that the carded webs are somewhat tensioned when being transferred in the direction of feeding from one conveyor belt to the next one in succession. The different and changing speeds of the belts make it difficult to master such tensioning when the carded webs are to be transferred freely between the various belts, and as a consequence thereof various tensions arise with resultant varying web thickness of the carded web. Depending on the deposition length, i.e. the width of the finished bat, the bat as discharged from the machine will in addition be at its thinnest in its middle and at its thickest at its longitudinal edges.

The present invention relates to a machine for crosswise deposition of carded webs advanced on a feeder belt, onto a continuously driven discharge belt which is positioned below the feeder belt and travels in a direction which is essentially at right angles to the direction of movement of the feeder belt, the machine comprising two conveyor belts for the carded web, these conveyor belts being arranged between the feeder belt and the discharge belt, and an outlet opening for the carded web, which opening is provided on a first travelling carriage adapted to be displaced in a reciprocating manner over the discharge belt in the transverse direction of the latter, an second travelling carriage.

In accordance with the French Pat. specification No. 1,243,035 the carded web travels between two belts during a certain part of the transfer operation. The carded web is not, however, locked during the entire transfer since before discharge, it is allowed to be supported freely on the lower run of the belt when the carriage is to the left of the roller. Such free transfer, although limited, is sufficient for the bat to tend to form folds when being transversely deposited on the conveyor belt. To tension the carded web is difficult since the belt must be driven at two different speeds depending upon the direction in which the two carriages are being driven. The reason necessitating two different speeds of the belt is that the intermediate layer on the upper side of this belt must be transported down to the lower run of the belt when the discharge carriage is being driven towards the left, and the reverse in the opposite direction of movement. It is consequently difficult to synchronize the speeds of the two belts which is, however, an absolute necessity if the thin and very delicate web is to maintain its evenness.

SUMMARY OF THE INVENTION

The object of the present invention is to overcome these drawbacks. The characterizing features of the invention are to be seen therein that both conveyor belts are arranged to be driven at the same speed, that an inlet opening formed

between the conveyor belts is arranged as so as to be stationary beneath the outlet end of the feeder belt, that the two conveyor belts travel over pulleys on the carriage on which the outlet opening is provided and that the second carriage is adapted to be displaced in such a direction and at such a speed relatively the first carriage that the two conveyor belts are held under a constant tension. The fundamental idea of the new machine for depositing carded webs in the transverse direction is the forced guidance of the carded web between two conveyor belts. This avoids the irregular and uneven web tensioning, so hard to control, between the conveyor belts on the travelling carriages, found in earlier known constructions. In addition, a continuous and even bat depositing is obtained. Furthermore, the machine will be comparatively short.

Further characterizing features and advantages of the present invention will become apparent from the subsequent description, reference being had to the accompanying partly diagrammatical drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partly broken side elevation of a machine in accordance with the invention with the travelling carriages shown in one end position,

FIG. 2 is a similar end elevation with the travelling carriages shown in the other end position,

FIG. 3 shows on an enlarged scale a lateral elevation of the upper travelling carriage,

FIG. 4 is a lateral elevation of the lower travelling carriage, and

FIG. 5 shows on an even large scale a section through the machine along lines V—V of FIG. 2.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

The frame 1 of the machine shown on the drawings comprise two legs 2 supporting horizontal beams 3, on which run the runner wheels 4 of two carriages 5 and 6. The beams are provided with one roller chain 7 each, see FIG. 5, between the rollers of which engage the teeth of chain wheels 8, these chain wheels being arranged on the same transverse shaft 9 on which the runner wheels 4 are arranged in pairs. The chains 7 and the chain wheels 8 insure that the carriages 5 and 6 are not inclined during their reciprocating movements on the beams 3.

The machine also comprises two conveyor belts 10 and 11 running in parallel over each their drive roller 12 and 13, respectively, which rollers are rotatably journaled at the upper part of the frame 1. The rollers 12 and 13 are positioned in such a way that an open top inlet opening 14 is formed between the conveyor belts 10 and 11 to receive the carded web 15 as the latter is being advanced by means of a feeder belt 16 at the upper part of the machine. The parallel runs 17 and 18, of the conveyor belts 10 and 11, respectively, travel over a common pulley 19 on the carriage 5 and further over a common pulley 20 on the carriage 6. From there, belt 10 runs over two pulleys 21 and 22 on the carriage 6 and over to two pulleys 23 and 24 on the carriage 5 back to drive roller 12, whereas conveyor belt 11, having left pulley 20 on the carriage 6, travels over two pulleys 25 and 26 on the latter carriage and over a pulley 27 on the carriage 5 back to its drive roller 13.

A steel wire 29 is attached to a carriage 6 at a point 28, said wire running over a pulley 30 at the left end of the frame 1 as seen on the drawings and extending along the entire length of the frame. The wire runs over a pulley 31 supported at the opposite frame end, further over a pulley 32 on carriage 5 and over two additional pulleys 33 and 34 at the right end of the frame and is attached at point 35 in the frame. A wire tensioning device is indicated at 36 and a spring balance is arranged between this device and frame point 35 to indicate the tensile stress of the wire.

A continuous drive belt 37 serves to move the carriages 5 and 7 on the frame beams 3 and said belt 37 runs over a drive wheel 38 at the left end of the frame and over a delinking wheel 39 at the right end of the machine. The belt 37 is driven continuously in one and the same direction as indicated by the arrows 40 and 41. The drive mechanism also includes a clutch 42 on the carriage 6 (see FIG. 4) The clutch consists of a compressed-air cylinder 43 which is attached on the carriage 6 so as to incline relatively the vertical plane and which is provided with a piston 44 protruding at both ends of the cylinder. The piston 44 is at the ends thereof provided with clamp shoes 45, 46, positioned opposite abutment plates 47 and 48, respectively, on the carriage 6. The upper run 37' of the belt 37 runs between the upper clamp shoe 45 and the abutment plate 47, and the lower run 37 runs between the lower shoe 46 and the abutment plate 48. The movement of the piston 44 upwards or downwards forces the upper part 37' or the lower part 37 against the abutment plate 47 or the abutment plate 48, respectively, whereby the carriage is brought to move to the right or the left, respectively, on the supporting beams 3.

Reference numbers 49 and 50 designate adjustable impulse means which are provided with buffers and which upon actuation by the carriage 6 at the end position thereof communicate a source of compressed air (not shown) with one end or the other of the cylinder 43 for displacing the piston 44 to the upper or lower end position of the latter.

The machine operates in the following manner with the initial position of the various parts of the machine being imagined to be the one shown in FIG. 1. The carriage 6 in its left end position has just struck on the impulse means 49 causing compressed air to be introduced at the lower end of the cylinder 43, whereby the piston 44 is forced upwards and the shoe 45 clamps belt run 37' against the abutment plate 47. The carriage 6 is then by the belt 37 driven in the direction of arrow 40. With the aid of the wire 29 which runs over pulleys 30, 31, 32, 33 and 34 also carriage 5 is forced to move in the direction of arrow 40. On account of the transmission provided by the pulley 32 on the carriage 5 the latter carriage will however, be able to move at only half the speed of carriage 6. The result is that the conveyor belts 10 and 11 will be kept continuously stretched and at a constant tension. The carded web 15 when leaving the conveyor belt 16 consequently will be advanced continuously through the inlet opening 14 and, with the same evenness and continuity, be discharged out through the outlet opening 51 between the pulleys 21 and 25 on the carriage 6. The carded web 15 is thus supplied as a transverse band down onto a continuously driven discharge belt 52 the direction of movement of which is at a right angle to the direction of movement of the carriage 6. When the carriage 6 reaches its right end position and abuts against the impulse means so, the source of compressed air is brought to communicate with the upper end of the cylinder 43, whereupon the piston 44 is forced downwards and the shoe 46 clamps the belt run 37 against the abutment 48, causing the carriage to be driven in the direction of arrow 41. The carded web 15 is now carried in the opposite direction to the immediately preceding one across the discharge belt 52 and since the latter is advanced at a low speed, the layers of the carded web will partly overlap. The speed of the discharge belt 52 determines

the thickness of the finished bat.

The embodiment as shown and described is to be regarded as an example only and the various parts of the machine could be constructively changed in various ways within the scope of the appended claims. The invention could be used also in so-called folding machines or cloth depositing machines. In order to further shorten the length of the machine it is possible to guide the carriage 5 in such a way that it runs in a substantially vertical direction instead of a horizontal one.

The conveyor belts 10, 11 are suitably formed from continuous fabrics with the warp and weft threads made from some synthetic material. Along their longitudinal edges they are preferably provided with guides which are coordinated with peripheral grooves in the pulleys, providing the required lateral guidance of the conveyor belts.

I claim:

1. An improved machine for crosswise deposition of carded webs advanced on a feeder belt, onto a continuously driven discharge belt which is positioned below the feeder belt and travels in a direction which is essentially at right angles to the direction of movement of the feeder belt, said machine comprising two conveyor belts for the carded web, these conveyor belts being arranged between said feeder belt and the discharge belt, an outlet opening for the carded web, said opening being provided on a first travelling carriage which is adapted to be displaced in a reciprocating manner over the discharge belt in the transverse direction of the latter, and a second travelling carriage, wherein the improvement comprises adapting the two conveyor belts to be driven at the same speed, an inlet opening formed between the conveyor belts, said inlet opening being arranged to be stationary beneath the outlet end of the feeder belt, means for running the two conveyor belts over pulleys on said first carriage on which said outlet opening is provided and means for adapting said second carriage to be displaced in such a direction and at such a speed relatively the first carriage that the two conveyor belts are held under a constant tension.

2. An improved machine in accordance with claim 1, wherein the improvement comprises arranging the carriage supporting the outlet end of the conveyor belts for connection in a manner known per se alternatively to one or the other run of a belt or similar endless transmission means running over two pulley wheels.

3. An improved machine in accordance with claim 2, wherein a clutch comprises a pneumatically operated piston in a cylinder in which said piston is adapted to move in a reciprocating manner, said piston being provided at both its ends with a clamping shoe which cooperates with a fixed abutment on the first carriage and is adapted to clamp the belt run in question against the associated abutment when the piston is axially displaced and thus connect said carriage to the belt run in question travelling between the shoe and the abutment.

4. An improved machine in accordance with claim 1, wherein the mutual speeds and directions of movement of the carriages are adjusted by a wire or the like, said wire being attached to the carriage controlling the outlet end of the conveyor belts and travelling in a manner known per se over a number of pulleys on the machine frame and said second carriage to an attachment point on the machine frame.