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(54) **A METHOD TO TRANSFER CLOTH TO A CLOTH FOLDING TABLE AND A DEVICE FOR PERFORMING THE METHOD.**

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Description

The present invention refers to a method for measuring, separating and transferring fabric, e.g. knitted fabric, from a stock, such as a roll, a staple or the like by means of a cloth laying machine in a tension-free condition to a laying table, whereby the fabric is fed from the stock via a feed roller and is laid down concurrently with the feed upon a horizontal mobile supporting surface, which is moved a distance corresponding to the length of the desired piece of fabric, the mobile supporting surface being arranged during the feed of the piece of fabric to lay down the piece upon the laying table concurrently with the extension of the supporting surface under the piece of fabric successively being reduced until the entire piece of fabric has been transferred to the laying table. The invention also relates to a cloth laying machine for tension-free transfer of said fabric to a laying table, and incorporating a feed roller for feeding the fabric to a mobile supporting surface, which is movable a distance corresponding to the length of the desired piece of fabric.

Background of the Invention

Laying of fabrics, particularly knitted fabrics, which are soft and extensible and at handling lack steadiness, i.e. they are flimsy generally spoken, upon a laying table, for further treatment, e.g. cutting out or punching out a complete stack of fabric pieces, is a time-wasting job as the laying must be effected completely tension-free. The fabric furthermore must be straightened along at least one longitudinal side edge, without tensile stresses thereby occuring in the fabric.

US-A-3,768,800 describes an apparatus for stacking sheet-like flexible material, which apparatus comprises an endless conveyor belt guided around and mounted in a carriage horizontally reciprocable between two end positions, the rollers being mounted in the frame of the apparatus in such a way that a belt loop located between the forwardly moving part and the backwardly moving part of the belt is shortened when the carriage makes its outward stroke and resumes its original length when the carriage makes its return stroke.

In this apparatus the material is fed from below to the endless belt, whereby at least part of the horizontal positions of the material laid on the belt is subjected to tensile forces. When the material is a fabric the mere weight of this fabric may be enough to cause the fabric to be stretched thus that it subsequently may shrink somewhat, which is not acceptable.

The purpose and most essential features of the Invention

The purpose of the present invention is to provide a method and a cloth laying machine, which make it possible to effect the tension-free transfer of fabric to a laying table. Another purpose is to effect this without any manual work and with a reliable and structurally uncomplicated construction. These tasks have been solved thereby that the fabric is fed from the feed roller vertically downwards against the mobile supporting surface, thereby forming an arc-shaped slacking, that the speed of the feed roller is controlled in dependency of the forming of said arc-shaped slacking of the fabric, that the fabric thus fed is severed, before the laying down on the laying table has begun, and the entire piece of fabric is placed tension-free on the supporting surface and that the mobile supporting surface during feed of the fabric is reeled up on or off from rollers provided one at each end of the supporting surface. The fundamental features of the cloth laying machine are apparent from claim 4.

Description of the Drawings

The invention will be further described hereinafter with reference to the drawings which show an embodiment.

Figure 1 shows a side elevation of the frame portion of the cloth laying machine.

Figure 2 shows a side elevation of the carriage of the cloth laying machine.

Figure 3 shows in bigger scale a section through the seizing members and smoothing means of the carriage.

Figures 4—10 show diagrammatic side elevations of cloth laying machines during different stages of the transfer.

Description of Embodiment

The cloth laying machine according to the invention comprises a frame 11, a laying table 12 and a carriage 14 displaceably arranged in guides 13 along the laying table. The frame 11 is arranged upon a table 15, which is vertically adjustable relative to the laying table by means of adjustment devices 16 acting upon the table legs. The frame 11 supports a feed roller 17, which is driven by a not further shown motor. The feed roller is located in such a manner in the frame that its forward portion is situated outside the frame thus that the forward end 19 of a fabric 20 can hang freely down in front of the frame, such as shown in figure 1. The fabric 20 comes from a stock (not shown), which can be a roll, a staple of cloth or the like. The frame 11 is provided with guides 21 in which a carriage 22 is displaceably arranged, and which carriage supports a motor-driven roller 23. At the frame there is furthermore arranged a cutting device 24, which by means of an adjustment device 25 can be pivoted from an inactive position to the active position shown in figure 1. At the frame there is furthermore provided at least one not further shown fabric holding-down rail, which clamps the fabric against the frame by means of e.g. pulling magnets, when the fabric shall be severed by means of the cutting device 24. Just above the roller 23 is provided a sensor 26, which optically senses the arc-shaped slacking of the fabric 20.

The feed roller 17 is axially displaceable by means of a not further shown electric shifting

motor, which is controlled by photo-electric cells, which sense one side edge of the fabric with regard to its straightness or any deviations resp., which can be compensated by axially displacing the felt-coated feed roller 17 to a corresponding extent.

The carriage 14, shown in figure 2 is driven by a motor 27 via the transmission 28. On the side of the carriage facing the frame 11 there is provided brackets 29, which support a motor-driven roller 30. A flexible sheet material 31 is attached to this roller and it serves as a supporting surface for the fabric 20 and has its opposite end fixedly connected to the roller 23 at the frame 11.

Behind the roller 30 the carriage 14 is equipped with a seizing member 32 incorporating two jaws 33 and 34 intended to receive and hold the forward edge 19 of the fabric. The seizing member 32 is operated via a slewing bracket 35 by an adjusting device 36, which in one, its retracted, end position closes the jaws 33, 34 and in which position a rail 37 carried by the slewing brackets 35 is in an inactive position adjacent and below the roller 30, whereas the slewing brackets 35 and the rail 37 in the extended end position of the adjusting device occupy the position intimated with dash-and-dot lines in figure 3, in which position the rail is active as a smoothing rail.

The carriage 14 is furthermore equipped with a device 38 for vertical adjustment connected to a retainer 39 at which said roller 30 with its brackets 29 and the seizing member 32 with the smoothing rail and the associated driving device are attached, and which together can be successively raised in a direction away from the laying table 12.

Function Description

The fabric 20 is fed from a roll of fabric by the feed roller 17 towards the laying table 12, thus that the end of the fabric will hang straight down from the roller. The carriage 14 has been driven up to its initial position immediately adjacent the frame 11, in which position the seizing member 32 with its opened jaws 33, 34 is located just in front of the fabric end edge 19. At a continued advance of the fabric effected by the feed roller the end edge will be caught by the seizing member 32. In the seizing member there is arranged a sensing member (not shown), which senses when the fabric edge has entered the seizing member and which gives an impulse for closing the jaws.

In connection to the advance of the fabric from the roller 18 a side edge guiding is also effected and if the side edge of the fabric should deviate from a straight track, then the feed roller makes an axial compensation movement.

As soon as the seizing member has closed about the end edge 19 of the fabric, the motor 27 of the carriage receives a starting pulse, which results in the carriage being displaced in a direction away from the frame 11. A sensor 26 senses optically the arc-shaped slacking 40 of the fabric, and if this deviates from a pre-set value, the feed roller is started, which concurrently with the displacement of the carriage 14 feeds so much of the fabric that this during the entire pulling out stage will rest tension-free on the flexible sheet material 31 serving as supporting surface.

When the fabric corresponding to the desired length of the fabric has been fed out, then the carriage is automatically stopped and the cutting device 24 operates, at the same time as at least one holding-down rail (not shown) clamps the fabric against the frame. The cutting device severs the fabric, and, as shown in figure 7, the severed fabric end 41 thereby will fall freely over the roller 23. The carriage continues a short further distance, thus that the end 41 of the piece of fabric will be located upon the flexible sheet material 31. During the entire pulling out operation flexible sheet material 31 has been wound off from the roller 23 at such pace that the flexible sheet material has been kept stretched. The roller 30 on the other hand has not rotated.

After completed pulling out of the piece of fabric 20 the laying procedure is started, whereby the carriage 14 and the roller 30 simultaneously are begun to be displaced towards the frame 11. This means that the roller 30 begins the movement to wind up the flexible sheet material 31, whereby the piece of fabric 20 is laid down on the laying table 12 concurrently with said displacement movement, see figure 8. Towards the end of the carriage movement the adjusting member 36 operates and pivots the rail 37 to active position, such as shown in figure 9. At a continued movement of the carriage the rollers 23 and 30 finally will occupy their initial position, shown in figure 10, whereby also the piece of fabric 20 has been entirely laid down on the laying table. During the last part of the carriage movement the rail 37 in its active position between the fabric 20 and the laying table 12 has acted as a smoothing member, whereby also the last piece of fabric will lay quite smoothed and tension-free on the table. With the carriage 14 in its initial position the adjusting member 36 again operates and locates the smoothing rail 37 in its parking position at the same time as the jaws 33, 34 of the seizing member 32 are opened thus that a new laying cycle can be started. This is started in that the entire frame 11 as well as the retainer 39 on the carriage 14 is elevated a distance corresponding to the thickness of a piece of fabric placed on the table. By means of a not further shown counter this procedure is repeated as many times as required till a desired number of pieces of fabric has been stacked upon each other.

The invention is not limited to the embodiment shown but a plurality of variations are possible within the scope of the claims.

Claims

1. A method for measuring, separating and transferring fabric, e.g. knitted fabric, from a stock, such as a roll, a staple or the like by means

of a cloth laying machine in a tension-free condition to a laying table (12), whereby the fabric (20) is fed from the stock via a feed roller (17) and is laid down concurrently with the feed upon a horizontal mobile supporting surface (31), which is moved a distance corresponding to the length of the desired piece of fabric, the mobile supporting surface (31) being arranged during the feed of the piece of fabric to lay down the piece upon the laying table concurrently with the extension of the supporting surface under the piece of fabric successively being reduced until the entire piece of fabric has been transferred to the laying table, characterized therein, that the fabric (20) is fed from the feed roller (17) vertically downwards against the mobile supporting surface, thereby forming an arc-shaped slacking, that the speed of the feed roller (17) is controlled in dependency of the forming of said arc-shaped slacking of the fabric, that the fabric (20) thus fed is severed, before the laying down on the laying table has begun, and the entire piece of fabric is placed tension-free on the supporting surface and that the mobile supporting surface (31) during feed of the fabric (20) is reeled up on or off from rollers (23, 30) provided one at each end of the supporting surface.

2. A method as claimed in claim 1, characterized therein, that one longitudinal side of the fabric (20) during transport from the stock to the supporting surface (31) is sensed by a sensor, which by means of control means adjust the axial displacement of the feed roller (17), for compensating out-of-straightness in the fabric.

3. A method as claimed in claim 1 or 2, characterized therein, that at least towards the end of the laying of the fabric upon the laying table (12) the fabric is smoothed by means of a rail (37) moved between the fabric and the laying table.

4. A cloth laying machine for tension-free transfer of fabric from a stock to a laying table as claimed in claim 1, and incorporating a feed roller (17) for feeding the fabric to a mobile supporting surface (31), which is movable a distance corresponding to the length of the desired piece of fabric, characterized therein, that the feed roller is situated above the supporting surface, which consists of a flexible sheet material or the like, the two ends of which are attached to one driveable roller (23, 30) each, that the flexible sheet material (31) can be wound off from or wound up on said rollers, that one of the rollers (30) is provided upon a carriage (14), which is movable above the laying table (12) along guides, that the second roller (23) for the supporting surface (31) is provided at a frame (11) supporting the feed roller (17), and that the second roller (23) is movable to a limited extent in the direction of movement of the first roller (30), from a position essentially outside the feed roller (17) to a position essentially inside said feed roller.

5. A laying machine as claimed in claim 4, characterized therein, that at the carriage (14) inside the first roller (30) there is provided a seizing member (32), which in one end position of the carriage adjacent the frame (11) is situated just in front of the fabric end edge (19) hanging down from the feed roller (17), said seizing member being adapted to seize and hold said fabric edge.

6. A laying machine as claimed in claim 5, characterized therein, that at the carriage (14) between the first roller (30) and the seizing member (32) is pivotably supported a smoothing rail (37), which is pivotable from an inactive position beside the roller to an active position below the fabric.

7. A laying machine as claimed in one or more of claims 4—6, characterized therein, that the frame (11) and also the first roller (30), the seizing member (32) and the smoothing rail (37) are vertically adjustable relative to the laying table (12).

Patentansprüche

1. Verfahren zum Messen, Trenne und Überführen von Stoff, beispielsweise Gewirk, von einem Vorrat, wie einer Rolle, einem Stapel od.dgl., mittels einer Stofflegemaschine in spannungsfreiem Zustand auf einen Legetisch (12), wobei der Stoff von dem Vorrat mittels einer Zuführrolle (17) zugeführt und gleichzeitig mit der Zufuhr auf eine horizontale, bewegliche Tragfläche (31) aufgelegt wird, die um eine Wegstrecke bewegt wird, welche der Länge des gewünschten Stoffabschnittes entspricht, wobei die bewegliche Tragfläche (31) während der Zufuhr des Stoffabschnittes derart angeordnet wird, daß der Stoffabschnitt auf den Legetisch gleichzeitig mit dem Ausfahren der Tragfläche unter den Stoffabschnitt sukzessiv verringert wird, bis der gesamte Stoffabschnitt auf den Legetisch überführt wurde, dadurch gekennzeichnet, daß der Stoff (20) von der Zuführrolle (17) vertikal nach unten zur beweglichen Tragfläche hin gefördert wird, wobei bogenförmige Schlaufen gebildet werden, daß die Geschwindigkeit der Zuführrolle (17) in Abhängigkeit vom Bilden der bogenförmigen Schlaufen des Stoffes gesteuert wird, daß der Stoff (20), der derart zugeführt wurde, abgetrennt wird, bevor das Ablegen auf dem Legetisch begonnen hat, und daß der gesamte Stoffabschnitt spannungsfrei auf die Tragfläche aufgelegt und die bewegliche Tragfläche (31) während der Zufuhr des Stoffes (20) auf Walzen (23, 30) aufgewickt oder von diesen abgewickelt wird, von welchen jeweils eine an jedem Ende der Tragfläche angeordnet ist.

2. Verfahren nach Anspruch 1, dadurch gekennzeichnet, daß eine Längsseite des Stoffes (20) während des Transportes vom Vorrat zur Tragfläche (31) mittels eines Sensors erfaßt wird, der mittels einer Regeleinrichtung die axiale Verschiebung der Zuführrolle (17) regelt, um eine Abweichung des Stoffes vom Geradliegen auszugleichen.

3. Verfahren nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß wenigstens gegen das Ende des Ablegens des Stoffes auf dem Legetisch (12)

der Stoff mittels einer Schiene (37) geglättet wird, die zwischen dem Stoff und dem Legetisch bewegt wird.

4. Stofflegemaschine zum spannungsfreien Überführen von Stoff von einem Vorrat zu einem Legetisch gemäß Anspruch 1, mit einer Zuführrolle (17) zum Zuführen des Stoffes zu einer beweglichen Tragfläche (31), die um eine Wegstrecke beweglich ist, welche der Länge des gewünschten Stoffabschnittes entspricht, dadurch gekennzeichnet, daß die Zuführrolle oberhalb der Tragfläche angeordnet ist, welche aus einem flexiblen Bogenmaterial od.dgl. besteht, dessen beide Enden an einer antreibbaren Walze (23, 30) befestigt sind, daß das flexible Bogenmaterial (31) von den Walzen abgewickelt oder auf diese aufgewickelt werden kann, daß eine der Walzen (30) auf einem Wagen (14) angeordnet ist, der oberhalb des Legetisches (12) entlang Führungen bewegbar ist, daß die zweite Walze (23) zum Tragen der Tragfläche (31) an einem Rahmen (11) vorgesehen ist, der die Zuführrolle (17) trägt, und daß die zweite Walze (23) in begrenztem Maße in Bewegungsrichtung der ersten Walze (30) bewegbar ist, und zwar aus einer im wesentlichen außerhalb der Zuführrolle (17) befindlichen Position in eine im wesentlichen innerhalb der Zuführrolle befindlichen Position.

5. Legemaschine nach Anspruch 4, dadurch gekennzeichnet, daß am Wagen (14) innerhalb der ersten Walze (30) ein Greiforgan (32) vorgesehen ist, das sich in einer Endposition des Wagens in der Nähe des Rahmens (11) gerade vor der Endkante (19) des Stoffes befindet und von der Zuführrolle (17) herabhängt, und daß das Greiforgan derart gestaltet ist, daß es die Stoffkante erfaßt und festhält.

6. Legemaschine nach Anspruch 5, dadurch gekennzeichnet, daß am Wagen (14) zwischen der ersten Walze (30) und dem Greiforgan (32) eine Glättschiene (37) schwenkbar gelagert ist, die aus einer inaktiven Position neben der Walze in eine aktive Position unterhalb des Stoffes verschwenkbar ist.

7. Legemaschine nach einem oder mehreren der Ansprüche 4 is 6, dadurch gekennzeichnet, daß der Rahmen (11) sowie die erste Walze (30), das Greiforgan (32) und die Glättschiene (37) relativ zum Legetisch (12) vertikal einstellbar sind.

Revendications

1. Procédé pour mesurer, séparer et transférer un tissu, par exemple un tissu tricoté, à partir d'une réserve, telle qu'une bobine, un coupon ou analogue, au moyen d'une machine de pose à plat de tissu dans un état sans tension sur une table de pose (12), de sorte que le tissu (20) est extrait de la réserve par l'intermédiaire d'un rouleau d'alimentation (17) et il est déposé simultanément à l'avance sur une surface support mobile horizontale (31) qui est déplacée d'une distance correspondant à la longueur de la pièce de tissu désirée, la surface support mobile (31) étant agencée pendant l'avance de la pièce de tissu de manière à déposer la pièce sur la table de pose en même temps que l'extension de la surface support sous la pièce de tissu est progressivement réduite jusqu'à ce que toute la pièce de tissu ait été transférée à la table de pose, caractérisé en ce que le tissu (20) est distribué par le rouleau d'alimentation (17) verticalement vers le bas contre la surface support mobile, de manière à engendrer un relâchement en forme d'arc, la vitesse du rouleau d'alimentation (17) est réglée en fonction de la formation dudit relâchement en forme d'arc du tissu, le tissu (20) ainsi distribué est coupé, avant le début du dépôt sur la table de pose, et toute la pièce de tissu est placée sans tension sur la surface support, et la surface support mobile (31) pendant la distribution du tissu (20) est enroulée sur des rouleaux ou déroulée de ces rouleaux (23, 30), prévus un à chaque extrémité de la surface support.

2. Procédé suivant la revendication 1, caractérisé en ce que un bord longitudinal du tissu (20), pendant le transport de la réserve à la surface support (31), est détecté par un capteur pour régler, à l'aide de moyens de commande, le déplacement axial du rouleau d'alimentation (17) afin de compenser le défaut d'alignement du tissu.

3. Procédé suivant la revendication 1 ou 2, caractérisé en ce que au moins vers la fin de la dépose du tissu sur la table de pose (12), le tissu est lissé au moyen d'une barre (37) déplacée entre le tissu et la table de pose.

4. Machine de pose de tissu à plat pour le transfert sans tension de tissu d'une réserve à une table de pose suivant la revendication 1, comprenant un rouleau d'alimentation (17) pour distribuer le tissu à une surface support mobile (31) qui est déplaçable d'une distance correspondant à la longueur de la pièce de tissu désirée, caractérisée en ce que le rouleau d'alimentation est situé au-dessus de la surface support, qui consiste en une feuille flexible ou matière analogue dont les deux extrémités sont attachées chacune à un rouleau motorisé (23, 30), la feuille flexible (31) peut être déroulée ou enroulée sur lesdits rouleaux, un des rouleaux (30) est monté sur un chariot (14) qui est déplaçable au-dessus de la table de pose (12) le long de guidages, le deuxième rouleau (23) pour la surface support (31) est prévu dans un bâti (11) supportant le rouleau d'alimentation (17), et le deuxième rouleau (23) est déplaçable d'une distance limitée dans la direction de mouvement du premier rouleau (30), d'une position sensiblement à l'extérieur par rapport au rouleau d'alimentation (17) à une position sensiblement à l'intérieur par rapport audit rouleau d'alimentation.

5. Machine de pose suivant la revendication 4, caractérisée en ce que dans le chariot (14), du côté intérieur du premier rouleau (30), il est prévu un organe de prise (32) qui est situé, dans une position extrême du chariot adjacente au bâti (11), juste en face du bord d'extrémité du tissu (19) qui pend du rouleau d'alimentation (17), ledit organe de prise étant conçu pour saisir et retenir ledit bord du tissu.

6. Machine de pose suivant la revendication 5, caractérisée en ce que dans le chariot (14) entre le premier rouleau (30) et l'organe de prise (32), une barre de lissage (37) est supportée de façon pivotante et peut pivoter d'une position inactive à côté du rouleau à une position active au-dessous du tissu.

7. Machine de pose suivant une ou plusieurs des revendications 4 à 6, caractérisé en ce que le bâti (11) et également le premier rouleau (30), l'organe de prise (32) et la barre de lissage (37) sont réglables verticalement par rapport à la table de pose (12).

FIG 1

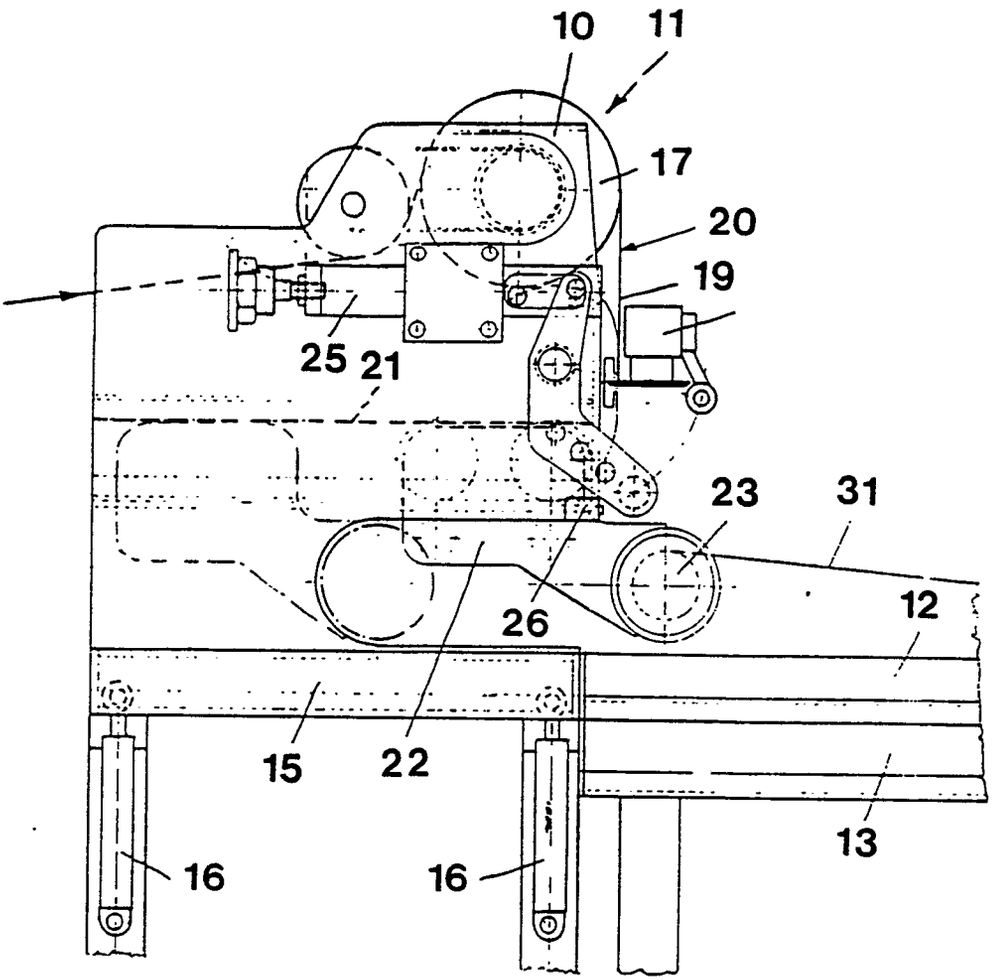


FIG 2

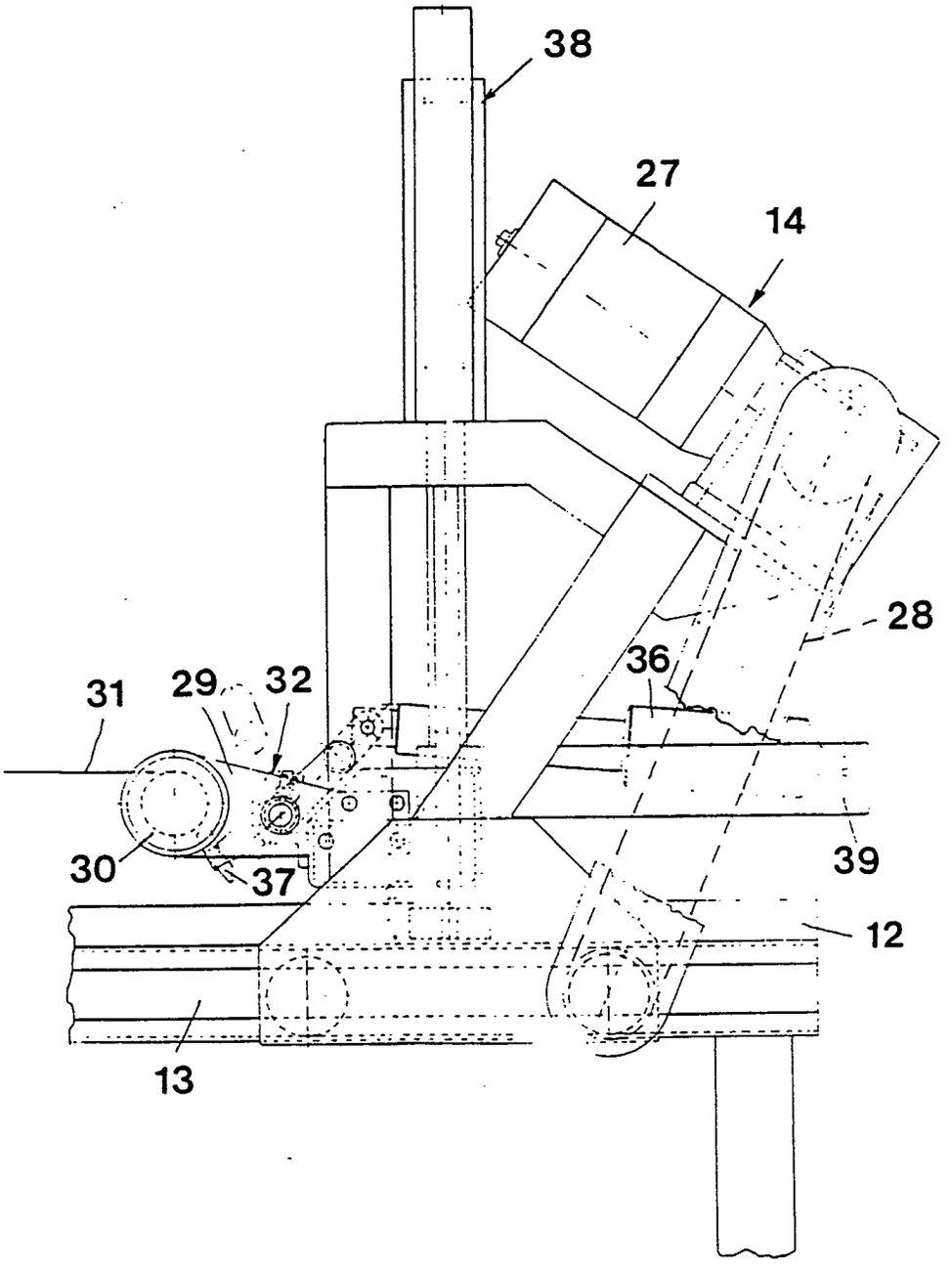


FIG 3

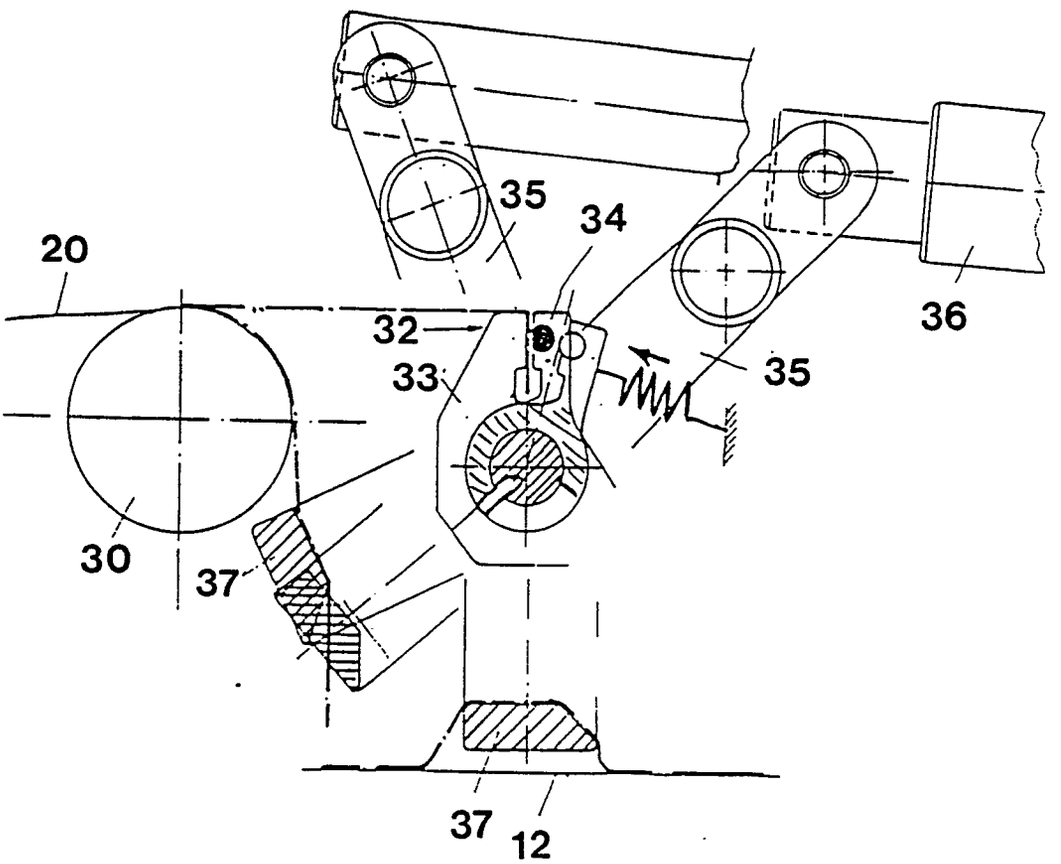


FIG 4

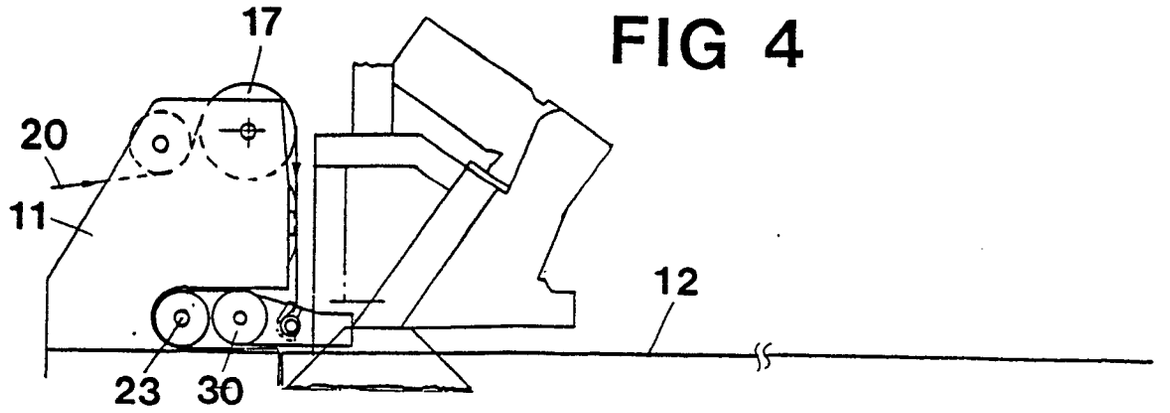


FIG 5

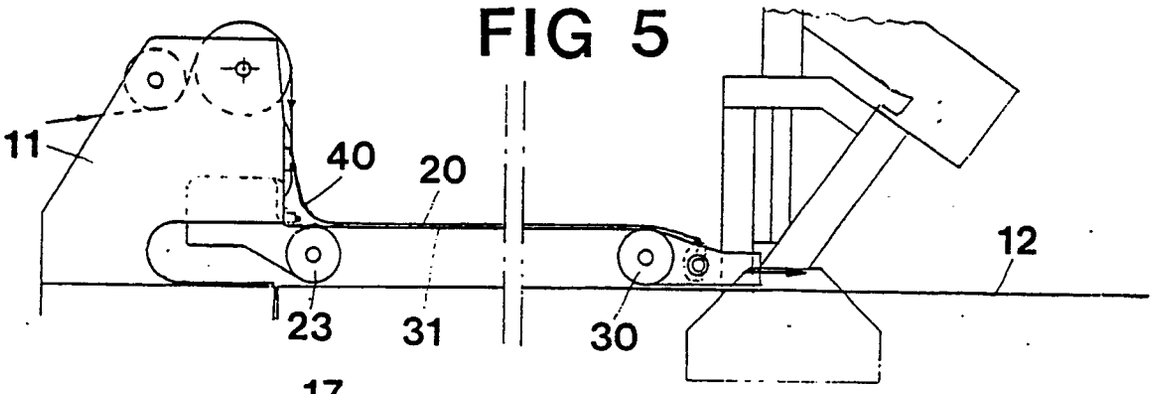


FIG 6

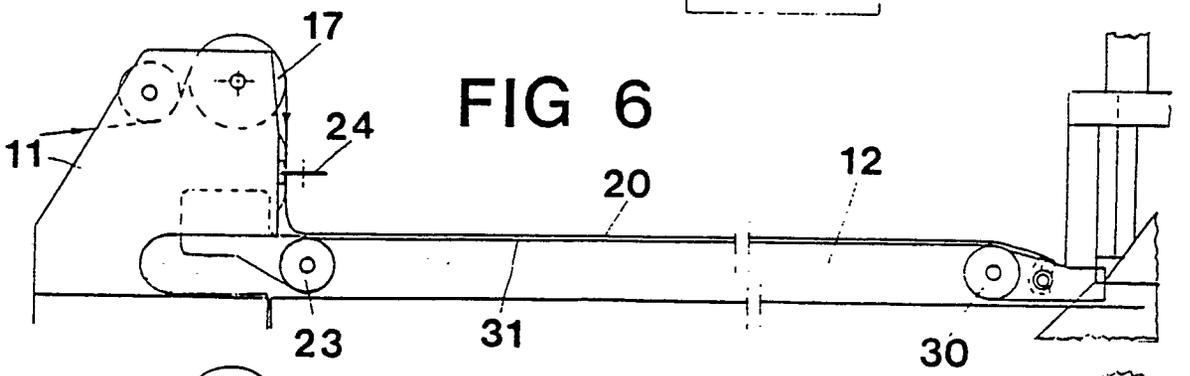


FIG 7

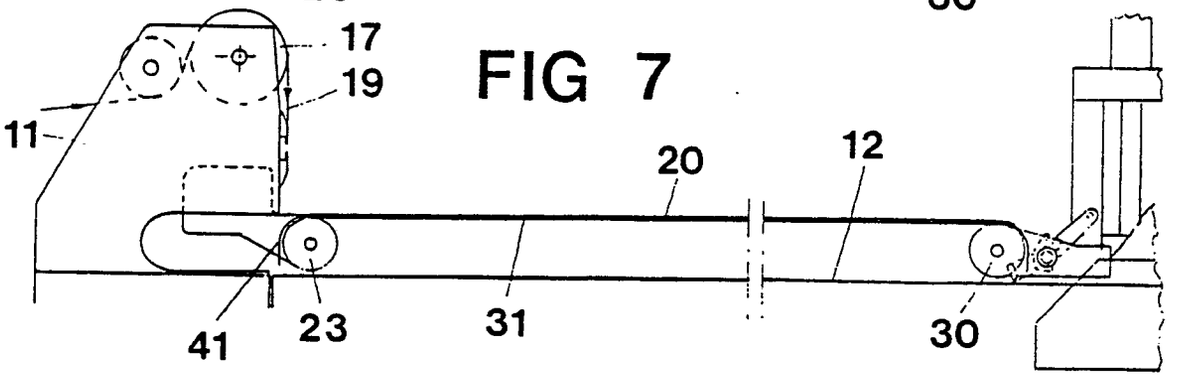


FIG 8

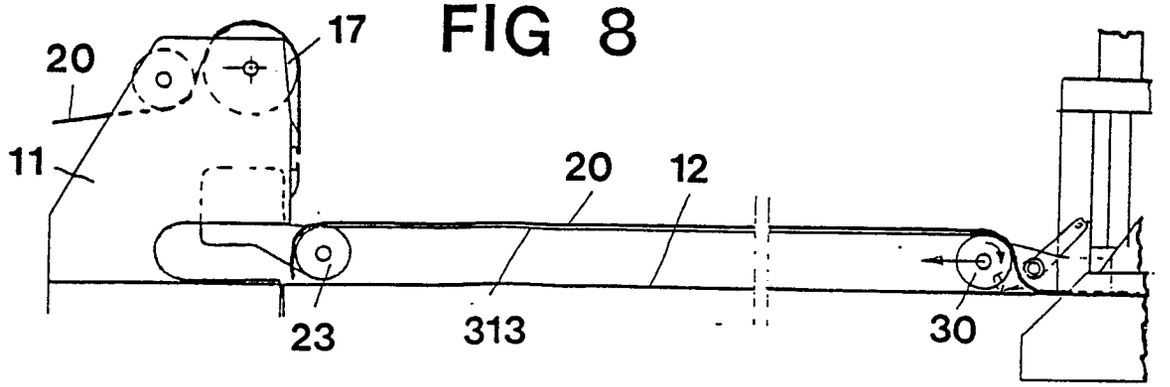


FIG 9

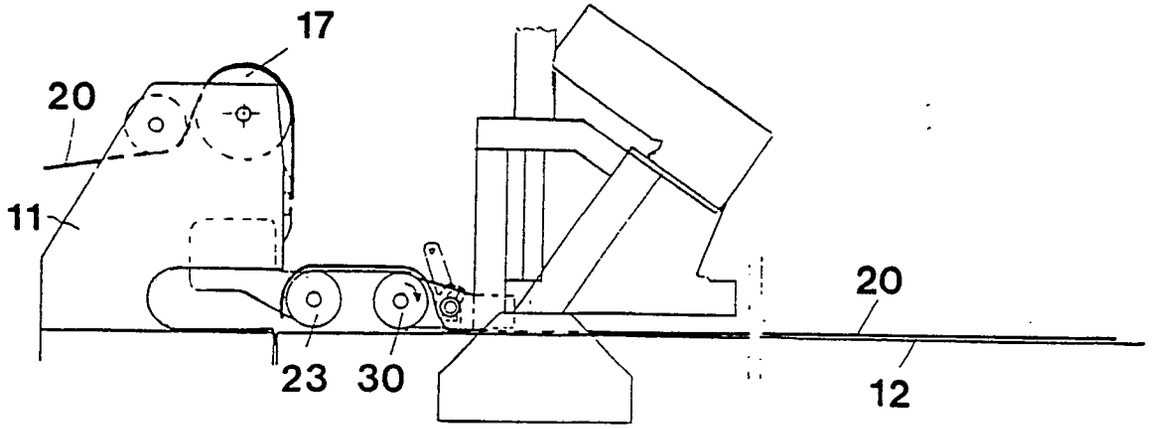


FIG 10

