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(54) **Apparatus for automatically selecting and loading cloth pieces on spreading machines**

Vorrichtung zum automatischen Auswählen und Beschicken von Textilgut auf Stofflegemaschinen

Dispositif de sélection et de chargement automatique de pièces textiles dans des machines de matelassage

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EP-A- 0 094 471
EP-A- 0 113 589
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Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to an apparatus for automatically selecting and loading cloth pieces rolls (hereinafter called "cloth pieces) on tentering machines.

[0002] As is known, inside the modern so-called cutting rooms, for making cloth articles in a large series, it is very important to hold a very high yield of the overall making system.

[0003] On the other hand, a lot of time is lost during the operation of these prior systems, mainly for performing the so-called change of cloth piece operations as necessary, as the type or colour of the cloth piece to be tentered must be modified as imposed by the operating program.

[0004] This operation is at present carried out by displacing the tentering machine to the starting portion of the working table and by manually replacing the cloth piece arranged inside the so-called carpet or belt cradle provided on the tentering machine.

[0005] Such an operation will cause a great time waste, to which also contributes the fact that the operator must properly know the proper loading sequence for operatively loading the cloth pieces as imposed by the tentering program.

[0006] Moreover, during the cloth piece loading and unloading manual operations, the operating personnel is subjected to safety problems.

[0007] The document EP-A-0 094 471, in the name of the same Applicant, discloses an apparatus for automatically selecting an at loading cloth pieces rolls according to the preamble of claim 1. The document EP-A-0 113 589 discloses loading/unloading means for use in a storing section of a cloth piece selecting and loading apparatus.

SUMMARY OF THE INVENTION

[0008] Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing an apparatus for automatically selecting and loading cloth pieces on tentering machines, which allows to select the cloth piece without the control by a second operator, in accordance with the tentering program actually provided in the tentering machine.

[0009] Within the scope of the above mentioned aim, a main object of the present invention is to provide such an apparatus with a very short cloth piece loading and unloading time, thereby allowing the tentering machine to operate in a substantially continuous manner.

[0010] Yet another object of the present invention is to provide such an automatic machine for selecting and loading/unloading cloth pieces which, owing to its peculiar constructional characteristics, is very reliable and safe in operation.

[0011] According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by an apparatus for automatically selecting and loading cloth piece rolls on tentering machine according to Claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Further characteristics and advantages of the present invention will become more apparent hereinafter from the following preferred, though not exclusive, embodiment of an apparatus for automatically selecting and loading cloth pieces on tentering machines, which is illustrated, by way of an indicative, but not limitative, example, in the figures of the accompanying drawings, where:

Figure 1 is a schematic elevation view illustrating the apparatus according to the present invention;
Figures 2 and 3 illustrate, in two different operating conditions, the cloth piece loading/unloading assembly associated with a tentering machine; and
Figures 4 and 5 illustrate the cloth piece loading/unloading assembly associated with the cloth piece storing section of the apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] With reference to the number references of the figures of the accompanying drawings, the apparatus for automatically selecting and loading cloth pieces on tentering machines, according to the present invention, which has been generally indicated by the reference number 1, comprises a tentering machine 2, of a per se known type, which can be displaced on a cloth piece tentering working table 3.

[0014] At the cloth piece tentering machine is provided a cloth piece loading/unloading assembly, for loading/unloading said cloth pieces to/from said tentering machine, said assembly being indicated by the reference number 10 and operating to engage the cloth pieces 11 and supply them, under the control of a preset program, to a cloth piece storing section, generally indicated by the reference number 20.

[0015] As it is necessary to replace the cloth piece on the tentering machine 2, this machine is displaced to the starting portion of the working table, and the holding roller 30 is lowered to its lowermost position, indicated by a dashed line 30c in figure 1, thereby allowing the cloth piece 11 to slide on the unloading path 12, so that said cloth piece will be supplied to the empty cradle 21 provided in the storing assembly or section 20.

[0016] After having unloaded the cloth piece, the holding roller 30 will be brought to a middle position, indicated by 30b, for waiting for the new cloth piece being loaded.

[0017] In this connection it should be apparent that the loading paddle 13 will be already loaded with a new

cloth piece and, accordingly, said cloth piece will be in a ready condition to be arranged inside the tentering machine.

[0018] The loading operation of the new cloth piece on the tentering machine is carried out by causing the loading paddle 13 to turn clockwise, so as to cause the cloth piece to be rolled by gravity.

[0019] In particular, the holding roller 30 is brought again to its uppermost or raised condition, so as to hold the cloth piece inside the tentering machine.

[0020] Then, the tentering machine can continue to operate, according to the tentering program.

[0021] While the tentering machine is performing the tentering program, the storing section 20 will preload the loading paddle 13 with the cloth piece 11 as provided by the program.

[0022] Such a pre-loading of the cloth piece is carried out by causing the loading paddle 13 to turn anticlockwise (figure 2).

[0023] This rotary movement of the loading paddle 13 will cause an arm of said paddle to partially tilt the cradle 21.

[0024] Such a tilting operation on the cradle 21 will cause the cloth piece to roll by gravity inside the loading paddle so as to provide the desired cloth piece loading operation.

[0025] Then, the loading paddle 13 will turn clockwise, to arrive at its standby position, thereby disengaging the cradle 21 to allow it to return to its vertical position.

[0026] In this connection it should be pointed out that the disclosed loading/unloading operating cycle is such as to reduce to a minimum the dead time for replacing a cloth piece, thereby improving the production yield of the overall system.

[0027] After this operating step, the storing section 20 will automatically reload the loading paddle 13 with the next cloth piece 11 provided by the tentering program, in this step the empty cradle 21, which was previously occupied by the cloth piece being now processed, being displaced upstream of the unloading region or path 12.

[0028] Now, for the previously unloaded cloth piece, two possibilities can arise:

1) the cloth piece, in accordance with the tentering program, must be reused within a very short time;
2) the cloth piece can be returned to the storing place and replaced by another cloth piece, coming from said storing place, since it must not be immediately used.

[0029] In the first case, the storing section 20 will hold the cloth piece 11 in its associated cradle 21, and will perform the conventional processing of the pieces in the tentering machine, under the control of the tentering program.

[0030] In the second case, the storing section will bring the cradle 21 and the piece 11 to be discarded contained therein to the loading/unloading assembly associated with the storing section 20, which has been generally indicated by the reference number 40 and which comprises an unloading paddle 41, of a slanted plane type, better shown in figure 4, provided for causing the piece 11 holding cradle to turn so as to bring the cloth piece onto a cloth piece unloading plane 42.

[0031] All of the mentioned cloth piece preparing operations are carried out in a fully automatic manner which is independent from the storing section 20, while the tentering machine is in operation, without affecting the production yield of the system.

[0032] Accordingly, the storing section has, in addition to a cloth piece reservoir function, a further function, of like importance, of properly sequentially supplying the fabric material to be processed.

[0033] With respect to the second case in which the cloth piece must be unloaded, it should be apparent that the cradle will be arranged at the unloading paddle 41 and moreover said cradle will be slightly turned so as to cause the cloth piece to roll out, to stop on the unloading plane 42.

[0034] Then, the empty cradle will be displaced to the next downstream position, at the loading plane 50, of the slanted type, including a loading paddle 51 which is caused to turn thereby allowing the new cloth piece 11, arranged on the loading plane 50, to enter the empty cradle of the storing section.

[0035] This new cloth piece will be available for the system to be used in accordance with the tentering program.

[0036] The unloaded cloth pieces, provided on the unloading plane 42, can be easily removed and returned to the storing place.

[0037] In this connection it should be moreover pointed out that the supplying and removal of the cloth pieces to/from the storing section 20 are fully automatic operations and can be performed while the tentering machine 2 is in operation, thereby preserving the high production yield of the overall system.

[0038] A further, and very important advantage, deriving from the slanted plane section, is that the operator handling the cloth pieces will have an easy passage area for said cloth pieces.

[0039] In particular, in this passage area, the operator can bring or take up cloth pieces, independently from the arrangement of the downstream system and, accordingly, it is not necessary that the operator be present each time the system will return or require a piece.

[0040] Moreover, the machine can be moreover provided with a cloth piece detection system, for example including a bar code or any other suitable codifying system, interfaced with the cloth piece tentering program, thereby it will be always possible to detect the processing step of the tentering machine, the type of the cloth piece being processed as well as the length thereof, in addition to all of the positions of the cloth pieces present in the storing section and the lengths of the pieces provided that this datum is present on the identifying bar

code.

[0041] In the case in which all of the mentioned conditions are present, it will be possible to control the overall cloth piece handling process, related to the present tentering program, in a fully automatic manner.

[0042] The invention as disclosed is susceptible to several modifications and variations all of which will come within the scope of the invention.

[0043] Moreover, all of the details can be replaced by other technically equivalent elements.

[0044] In practicing the invention, the used materials, as well as the contingent size and shapes, can be any, depending on requirements.

Claims

1. An apparatus (1) for automatically selecting and loading cloth piece rolls on a tentering machine (2), comprising a cloth piece roll storing section (20) including a first cloth piece roll loading/unloading assembly (10) for loading/unloading cloth piece rolls (11) to/from said tentering machine (2), according to a preset program, **characterized in that** upstream of said storing section (20) a second cloth piece roll loading/unloading assembly (40) is provided, for loading/unloading cloth piece rolls (11) to/from said storing section, that said first cloth piece roll loading/unloading assembly (10) comprises a cloth piece roll loading rotary paddle (13) which can be rotatively driven in a first direction for respectively receiving a cloth piece roll from said storing section (20) and in a second opposite direction for loading said cloth piece roll on said tentering machine (2), and that said second cloth piece roll loading/unloading assembly (40) comprises a slanted paddle (41).

2. An apparatus according to Claim 1, **characterized in that** said apparatus comprises moreover, in said storing section, a plurality of piece cloth roll receiving tiltable cradles (21) which can be simultaneously driven in two driving directions, for arranging said cradles (21) in preset stations.

3. An apparatus according to Claims 1 and 2, **characterized in that** said apparatus comprises moreover an unloading plane (42), upstream of said storing section (20), for unloading the cloth piece rolls (11) from said storing section (20) and for conveying the unloaded cloth piece rolls (11) to a storing place.

4. An apparatus according to one or more of the preceding claims, **characterized in that** said apparatus comprises moreover, upstream of said storing section (20), a cloth piece roll loading plane (50) for arranging thereon cloth piece rolls (11) to be supplied to said cradles (12) of said storing section.

5. An apparatus according to Claim 4, **characterized in that** said loading plane (50) comprises a cloth piece roll loading tiltable paddle (51), for supplying said cloth piece rolls (11) from said loading plane (50) to an empty cradle (21) in said storing section (20).

6. An apparatus according to one or more of the preceding claims, **characterized in that** said apparatus comprises moreover a detecting system for detecting said cloth piece rolls (11), said detecting system being designed for detecting said cloth piece rolls (11) on said loading and unloading planes therefor, in order to supply the tentering program with an information related to the positions and types of said cloth piece rolls held in said storing section (20).

Patentansprüche

1. Vorrichtung (1) zum automatischen Auswählen und Laden von Textilgutrollen auf eine Spannmaschine (2) mit einem Textilgutrollen-Lagerungsabschnitt (20) einschließlich einer ersten Textilgutrollen-Lade/Entladebaugruppe (10) zum Laden/Entladen von Textilgutrollen (11) auf die/von der Spannmaschine (2) entsprechend einem zuvor eingestellten Programm,
dadurch gekennzeichnet, daß
stromaufwärts des Lagerungsabschnittes (20) eine zweite Textilgutrollen-Lade/Entladebaugruppe (40) zum Laden/Entladen von Textilgutrollen (11) auf den/von dem Lagerungsabschnitt vorgesehen ist, daß die erste Textilgutrollen-Lade/Entladebaugruppe (10) eine drehbare Textilgutrollen-Ladeschaufel (13) aufweist, die in einer ersten Richtung so drehbar antreibbar ist, daß sie jeweils eine Textilgutrolle von dem Lagerungsabschnitt (20) erhält, sowie in einer zweiten entgegengesetzten Richtung, um die Textilgutrolle auf die Spannmaschine (2) zu laden, und daß die zweite Textilgutrollen-Lade/Entladebaugruppe (40) eine schräge Schaufel (41) aufweist.

2. Vorrichtung nach Anspruch 1,
dadurch gekennzeichnet, daß
die Vorrichtung darüber hinaus in dem Lagerungsabschnitt eine Mehrzahl von kippbaren Textilgutrollenaufnahme-Hängegestellen (21) aufweist, die gleichzeitig in zwei Antriebsrichtungen antreibbar sind, um die Hängegestelle (21) in zuvor eingestellten Stationen anzuordnen.

3. Vorrichtung nach den Ansprüchen 1 und 2,
dadurch gekennzeichnet, daß
die Vorrichtung darüber hinaus stromaufwärts des Lagerungsabschnittes (20) eine Entladeebene (42)

zum Entladen der Textilgutrollen (11) von dem Lagerungsabschnitt (20) und zum Befördern der entladenen Textilgutrollen (11) zu einem Lagerungsplatz aufweist.

4. Vorrichtung nach einem oder mehreren der vorangegangenen Ansprüche,
dadurch gekennzeichnet, daß
die Vorrichtung darüber hinaus stromaufwärts des Lagerungsabschnittes (20) eine Textilgutrollen-Ladeebene (50) aufweist, um darauf zu den Hängegestellen (12) des Lagerungsabschnittes zu befördernde Textilgutrollen (11) anzuordnen.

5. Vorrichtung nach Anspruch 4,
dadurch gekennzeichnet, daß
die Ladeebene (50) eine kippbare Textilgutrollen-Ladeschaufel (51) zum Befördern der Textilgutrollen (11) von der Ladeebene (50) zu einem leeren Hängegestell (21) in dem Lagerungsabschnitt (20) aufweist.

6. Vorrichtung nach einem oder mehreren der vorangegangenen Ansprüche,
dadurch gekennzeichnet, daß
die Vorrichtung darüber hinaus ein Erkennungssystem zum Erkennen der Textilgutrollen (11) aufweist, wobei das Erkennungssystem zum Erkennen der Textilgutrollen (11) auf den dafür vorgesehenen Lade- und Entladeebenen konstruiert ist, um das Spannprogramm mit Informationen in bezug auf die Positionen und die Arten von in dem Lagerungsabschnitt (20) aufbewahrten Textilgutrollen bereitzustellen.

Revendications

1. Dispositif (1) de sélection et de chargement automatique de rouleaux de pièce textile dans une machine de matelassage (2), comprenant une section de stockage de rouleaux de pièce textile (20) incluant un premier assemblage (10) de chargement/déchargement de rouleaux de pièce textile pour charger/décharger des rouleaux de pièce textile (11) vers/à partir de ladite machine de matelassage (2), selon un programme présélectionné, **caractérisé en ce qu'**en amont de ladite section de stockage (20) un second assemblage (40) de chargement/déchargement de rouleaux de pièce textile est prévu, pour charger/décharger des rouleaux de pièce textile (11) vers/à partir de ladite section de stockage,**en ce que** ledit premier assemblage de chargement/déchargement de rouleaux de pièce textile (10) comprend une pale rotative (13) de chargement de rouleaux de pièce textile qui peut être actionnée de manière rotative dans une première direction pour respectivement recevoir un rouleau de pièce textile à partir de ladite section de stockage (20) et dans une seconde direction opposée pour charger ledit rouleau de pièce textile sur ladite machine de matelassage, et **en ce que** ledit second assemblage de chargement/déchargement de rouleaux de pièce textile (40) comprend une pale inclinable (41).

2. Dispositif selon la revendication 1, **caractérisé en ce que** ledit dispositif comprend de plus, dans ladite section de stockage, plusieurs paniers inclinables (« tiltable crades ») (21) recevant des rouleaux de pièce textile qui peuvent être actionnés simultanément dans deux directions d'actionnement, pour disposer lesdits paniers dans des positions présélectionnées.

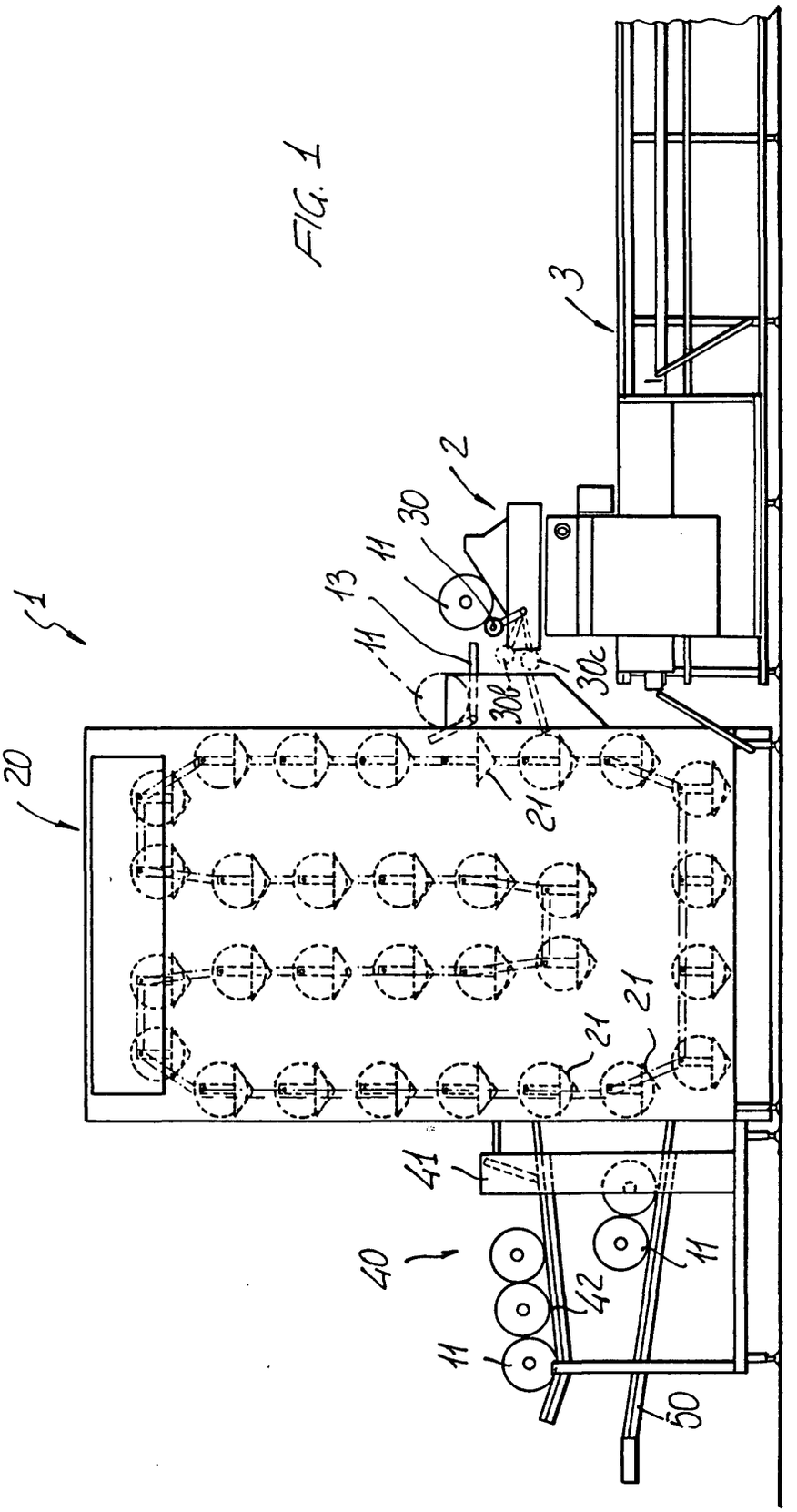
3. Dispositif selon les revendications 1 et 2, **caractérisé en ce que** ledit dispositif comprend de plus un plan de déchargement (42), au-dessus de ladite section de stockage (20), pour décharger les rouleaux de pièce textile (11) à partir de ladite section de stockage (20) et pour transporter les rouleaux de pièce textile (11) déchargés vers un emplacement de stockage.

4. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit dispositif comprend de plus, au-dessus de ladite section de stockage (20), un plan de chargement de rouleaux de pièce textile (50) pour disposer sur lui des rouleaux de pièce textile (11) qui seront foumis audits paniers (21) de ladite section de stockage.

5. Dispositif selon la revendication 4, **caractérisé en ce que** ledit plan de chargement (50) comprend une pale inclinable (51) de chargement de rouleaux de pièce textile pour fournir lesdits rouleaux de pièce textile (11) issus dudit plan de chargement (50) à un panier vide (21) dans ladite section de stockage (20).

6. Dispositif selon l'une quelconque des revendications précédentes, **caractérisé en ce que** ledit dispositif comprend de plus un système de détection pour détecter lesdits rouleaux de pièce textile (11), ledit système de détection étant désigné pour détecter lesdits rouleaux de pièce textile (11) sur lesdits plans de chargement et de déchargement pour cela, dans le but de foumir au programme de matelassage une information relative aux positions et aux types desdits rouleaux de pièce textile maintenus dans la section de stockage (20).

FIG. 1



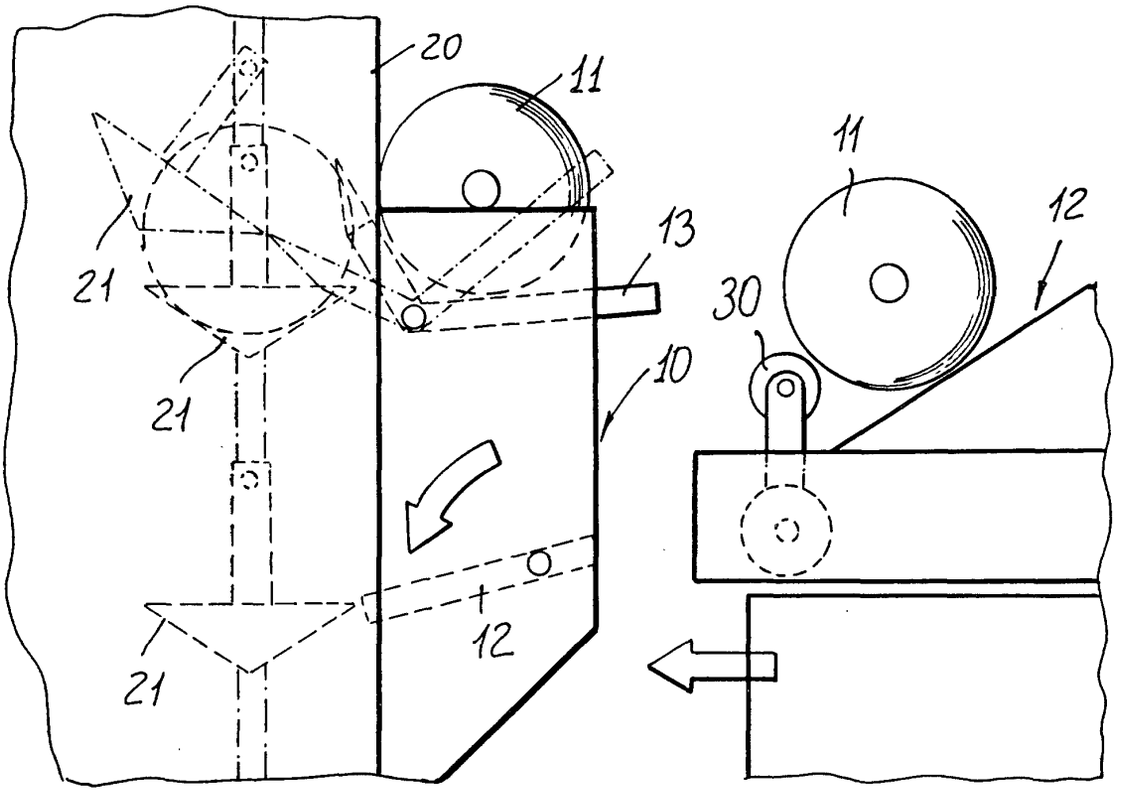


FIG. 2

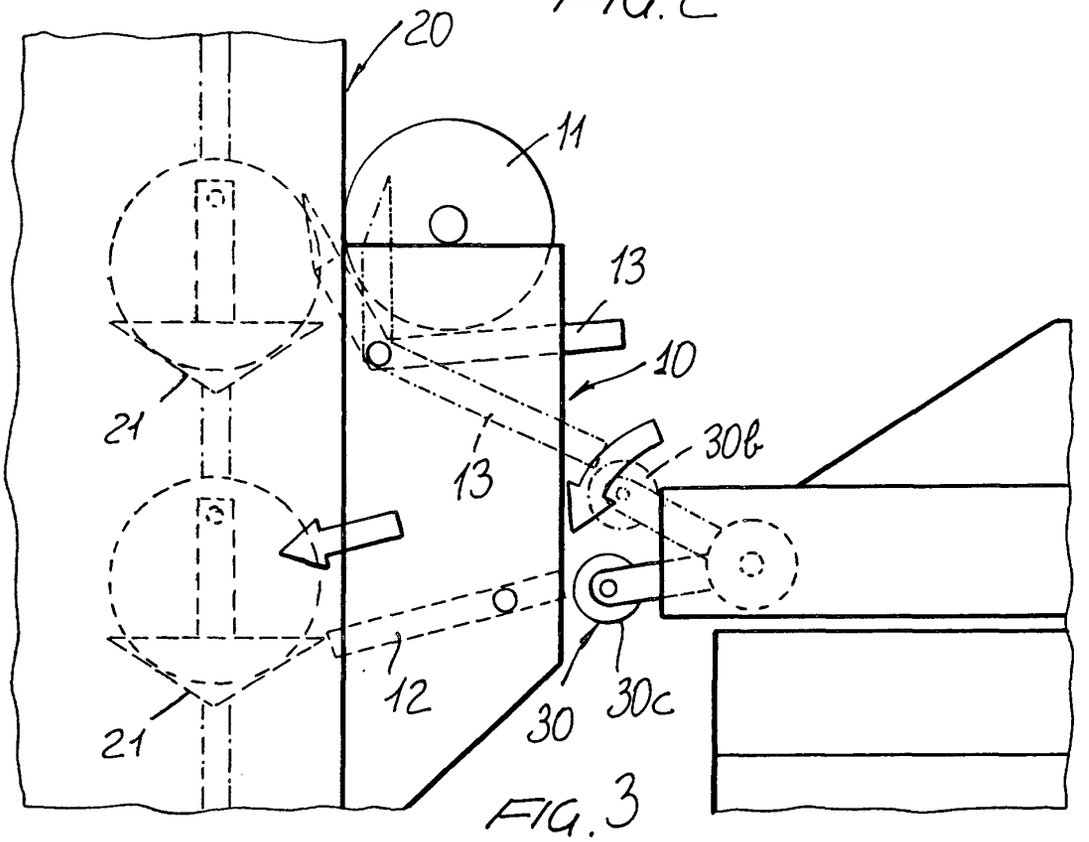


FIG. 3

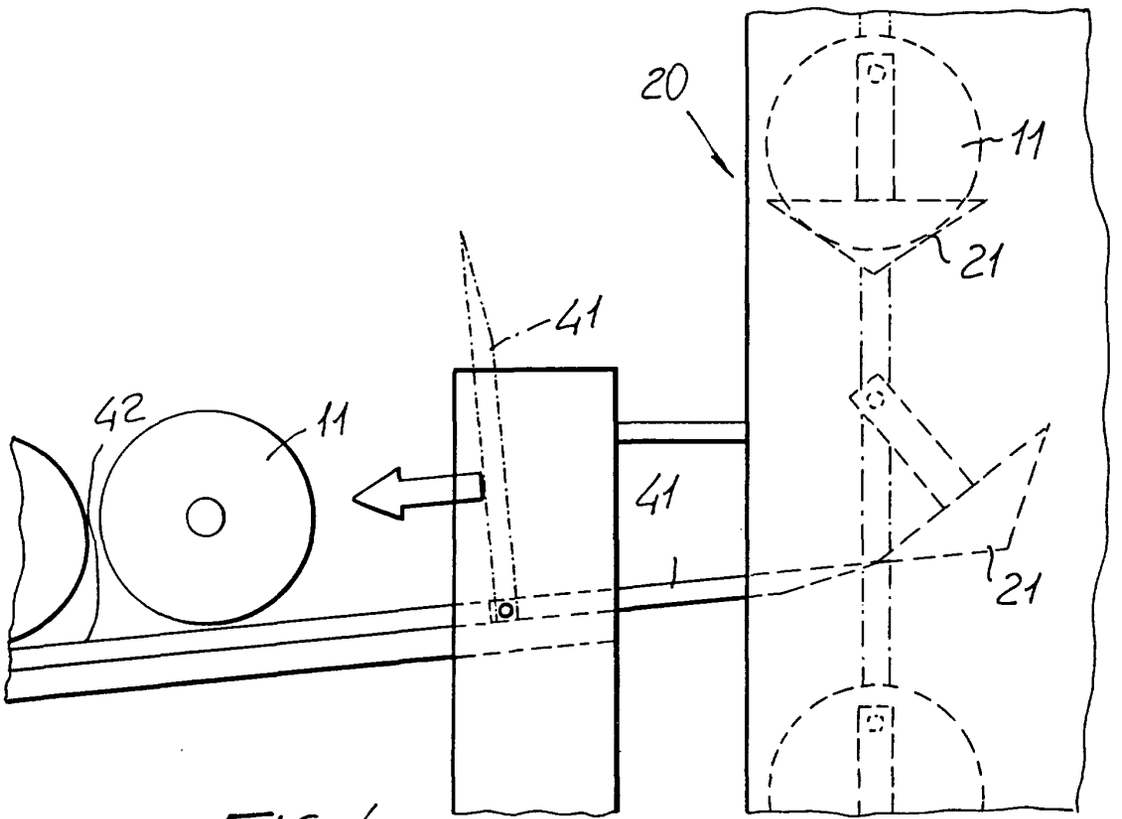


FIG. 4

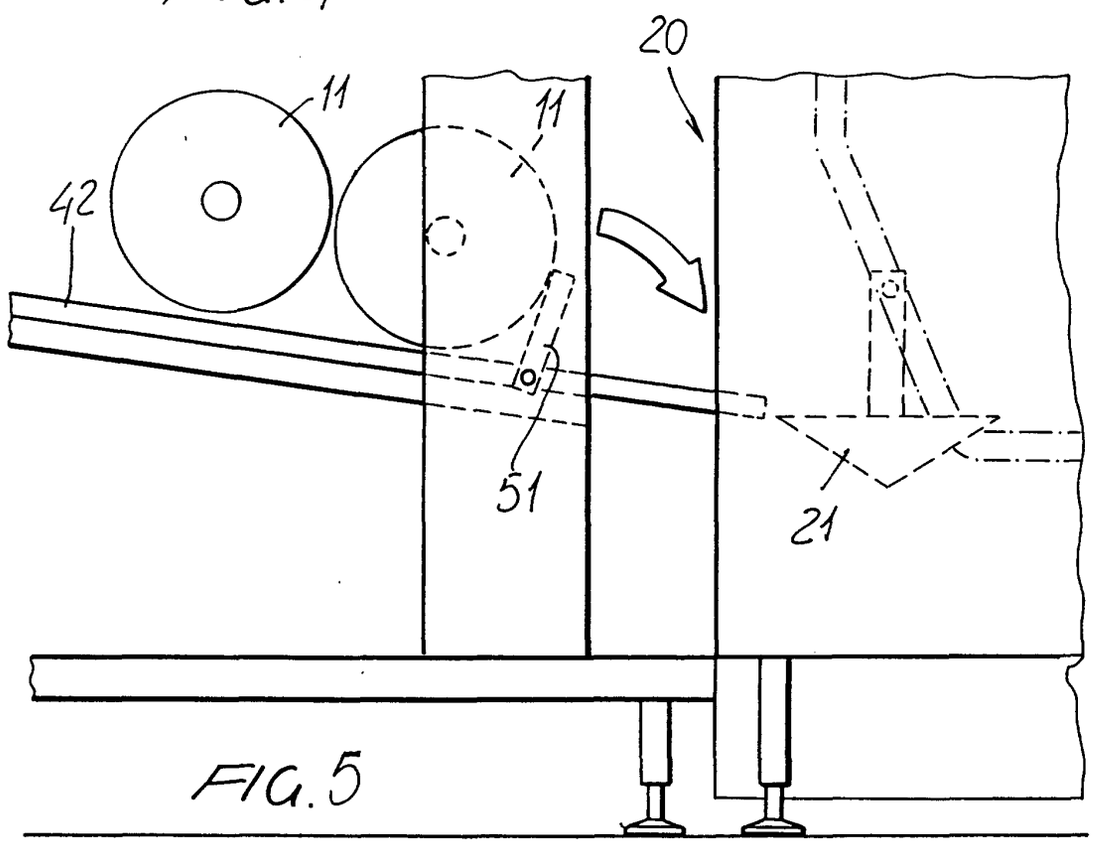


FIG. 5