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(54) **Film cutting mechanism for a stretch-film wrapping machine**

(57) The invention relates to a novel type of solution for a film cutting mechanism in a stretch-film wrapping machine, as well as to a novel type of stretch-film wrapping machine. The film cutting mechanism in a stretch-film wrapping machine of the invention is constituted by

a spring-loaded tongue (10). The solution of the invention can be utilized for packaging duties in a variety of industries.

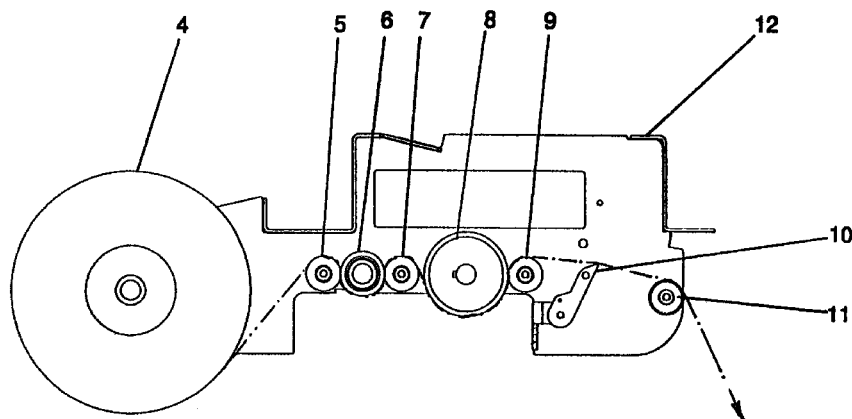


FIGURE 2

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Description

[0001] The present invention relates to a novel type of solution for a film cutting mechanism in a stretch-film wrapping machine, as well as to a novel type of stretch-film wrapping machine. The solution of the invention can be utilized for packaging operations in a variety of industries.

[0002] In view of wrapping articles of various sizes, stretch-film wrapper of plastics has proved to be an excellent solution. As a material, plastic stretch-film wrapper is economical, elastic, light, strong, easy-to-handle, and holds articles well together. Plastic stretch-film wrapper is also effective in protecting articles from dirt and dust.

[0003] Stretch-film wrapper is often used for example in food industry, both in processing facilities and intermediate wholesale stores, for example for wrapping articles of dry goods for pallet-sized shipments to be delivered to customer businesses. Furniture industry is another example, wherein stretch-film wrapper is often used for wrapping pieces and consignments of furniture.

[0004] In stretch-film wrapping machines, an article to be packaged is wrapped in a web of plastic film. The wrapping may be carried out in such a way that a film dispenser is mounted on a stationary mast and an article to be wrapped is rotating, or such that a film dispenser is mounted on a movable mast or frame which is rotating, and the article being wrapped remains stationary.

[0005] The prior art will be described next with reference to the accompanying figure 1, depicting a stretch-film wrapping machine of the prior art.

[0006] Fig 1 illustrates a stretch-film wrapping machine of the prior art. In the stretch-film wrapping machine of the prior art, a film dispenser 3 is mounted on a stationary mast 1 and an article to be wrapped rotates on a turntable 2. The film dispenser 3 can be guided up and down along the stationary mast 1 of the stretch-film wrapping machine.

At the completion of a wrapping process, the stretch-film wrapper between a film dispenser and an article to be wrapped must be severed automatically for the machine operator not having to do it manually.

[0007] Traditionally, the cutting of a wrap film has been accomplished by using an electrically heated resistance wire, which heats up after a wrapping process and moves into the engagement with the wrap film, thus severing the film.

[0008] In the solution using a resistance wire, the heating of a wire requires substantial power and, thus, the wire must be provided with a sizable current supply. Another problem is the complexity of a mechanism required for the deflection of a resistance wire. Since it cannot be allowed to stay in contact with the film wrapper all the time, the wire must be deflected from a lateral direction for example by means of motor. As a result of

plastics being burnt by the wire, small amounts of combustion gases from plastics will also be released in the air.

[0009] Another prior known method is to make a tiny hole in the vicinity of the edge of a wrap film by means of a solenoid present in a film dispensing carriage, while the wrapping is still in progress. After the hole is formed, the wrapping is continued momentarily until the film has advanced to such an extent that the hole present in the film is located half-way between the film dispensing mechanism and an article being wrapped. At this point, the dispensing of wrap film is discontinued for tensioning the film and tearing it in line with the hole.

[0010] A problem with puncturing a wrap film by a solenoid, as described in the prior art, is the electric drive required by the solenoid.

[0011] It is an object of the present invention to provide such a solution for cutting a wrap film in a stretch-film wrapping machine, which is capable of overcoming the above problems and eliminating the above defects. In order to accomplish this, a film cutting mechanism of the invention for a stretch-film wrapping machine is characterized in that the film cutting mechanism comprises a spring-loaded tongue set between a roll of film and a film dispenser. Furthermore, a stretch-film wrapping machine of the invention is characterized in that the stretch-film wrapping machine is provided with a film dispenser, comprising a roll of film, film driving rollers, film guide rollers, a film discharge roller, as well as a film cutting mechanism set between the film roll, preferably the film guide roller, and the discharge roller and constituted by a spring-loaded tongue.

[0012] The invention will now be described in detail with reference to the accompanying drawings, wherein:

- fig. 1 shows a stretch-film wrapping machine of the prior art,
- fig. 2 shows a film dispenser of the invention for a stretch-film wrapping machine,
- fig. 3 shows a film cutting mechanism of the invention for a stretch-film wrapping machine,
- fig. 4 shows the arrangement of a film cutting mechanism relative to a film dispenser in a stretch-film wrapping machine of the invention.

[0013] Fig. 1 has been described above. The solution of the invention will be described hereinafter with reference to figs. 2-4, which illustrate one embodiment for the solution of the invention.

[0014] Fig. 2 depicts a film dispenser of the invention for a stretch film wrapping machine. The film dispenser of the invention for a stretch film wrapping machine comprises a roll of film 4, film driving rollers 6, 8, film guide rollers 5, 7, 9, a film discharge roller 11, as well as a film cutting mechanism 10 set between the film guide roller 9 and the discharge roller 11. The film dis-

penser for a stretch film wrapping machine of the invention is designated with reference numeral 12. The film is depicted by a dash-and-dot line.

[0015] The film cutting mechanism of the invention for a stretch film wrapping machine comprises a small spring-loaded tongue 10 set between the film guide roller 9 and the discharge roller 11 of the film dispenser 12, which in an operating state is in engagement with the wrap film. As the wrap film is pulled conventionally out of the film dispenser 12, said film glides along in contact with the tongue 10 without any damage to the film. When it is desirable to form a hole in the wrap film, the film advancing direction is reversed, i.e. the film is retracted into the dispenser 12. Thus, as a result of the way the tongue 10 is spring-loaded and designed, said tongue 10 punctures the wrap film and produces a hole.

[0016] After the hole is formed, the wrapping is continued momentarily until the wrap film has advanced to such an extent that the hole present in the film is located half-way between the film dispenser 12 and an article being wrapped. At this point the feeding of wrap film is discontinued, whereby the film stretches and tears off in line with the hole.

[0017] Fig. 3 shows a film cutting mechanism of the invention for a stretch-film wrapping machine. The film cutting mechanism 10 of the invention for a stretch-film wrapping machine is constituted by a spring-loaded tongue. The spring is not shown in the figure.

[0018] Fig. 4 illustrates the arrangement of a film cutting mechanism of the invention in a stretch-film wrapping machine in relation to a film dispenser. Between the film guide roller 9 and the discharge roller 11 of the film dispenser 12 is a small spring-loaded tongue 10, such that, in an operating state, as the web of film is being pulled out of the film dispenser 12, the wrap film glides in contact with the tongue 10 without damage to the film. When the feeding direction of wrap film is reversed, i.e. the film is retracted into the film dispenser 12, as a result of the way the tongue 10 is spring-loaded and designed, said tongue 10 punctures the wrap film and produces a hole. After the hole is formed, the feeding of wrap film is discontinued, whereby the film stretches and tears off in line with the hole.

[0019] The film cutting mechanism 10 of the invention for a stretch-film wrapping machine can be positioned relative to a wrap film emerging from the film dispenser 12 in the proximity of its middle section, bottom section, or top section. The film dispenser 12 can be mounted on a stationary mast, in which case an article to be wrapped is rotating, or, optionally, the film dispenser 12 can be mounted on a movable mast or a rotating frame, in which case an article to be wrapped remains stationary.

[0020] The solution of the invention involves a basic idea that, within the film dispenser, the stretch film is formed with a small hole which initiates tearing off the wrap film as the delivery of wrap film is discontinued

after a brief delay. The solution of the invention offers an advantage over the prior art solution in the sense that the hole is formed without a solenoid or the like device, merely by means of the mechanical design of a wrap-film dispensing system.

[0021] The invention offers a benefit that the technique of making the actual hole is very simple. The retraction of a wrap film can be implemented for example by means of a film prestretching mechanism, the wrap film being tensioned by means of motor.

Claims

1. A film cutting mechanism for a stretch-film wrapping machine, comprising a spring-loaded tongue (10) set between a roll of wrap film (4) and a discharge roller (11) of a film dispenser (12), which is in engagement with the wrap film, and wherein the spring-loaded tongue (10) is between a guide roller (9) and the discharge roller and is, in an operating state, in engagement with the wrap film in such a way that, as the wrap film is being pulled conventionally out of the film dispenser (12), the wrap film glides along in engagement with the tongue (10) without any damage to the film, **characterized** in that the wrap film is provided with a hole by reversing the film advancing direction back into the film dispenser (12), the tongue (10) extending through the wrap film, and that the retraction of the wrap film is implemented by means of a film prestretching mechanism.
2. A stretch-film wrapping machine, **characterized** in that the stretch-film wrapping machine is provided with a film dispenser (12), comprising a roll of film (4), film driving rollers (6, 8), film guide rollers (5, 7, 9), a film discharge roller (11), as well as a film cutting mechanism (10) set between the roll of film (4), preferably the film guide roll (9), and the discharge roller (11) and constituted by a spring-loaded tongue (10).
3. A method, wherein a film cutting mechanism in a stretch-film wrapping machine is used for severing automatically a wrap film stretched about a packaged article, **characterized** in that the wrap film is formed with a hole by means of a spring-loaded tongue (10), set between a roll of film (4) and a film dispenser discharge roller (11) in the film cutting mechanism, by reversing the film advancing direction back into the dispenser, the tongue penetrating through the wrap film, and that the retraction of the wrap film is implemented by means of a film prestretching mechanism.
4. A method as set forth in claim 3, **characterized** in that, after the hole is formed, the wrapping is continued momentarily until the wrap film has advanced

to such an extent that the hole present in the wrap film is located half-way between a film dispenser (12) and an article being wrapped, whereafter the delivery of wrap film is discontinued with the result that the wrap film tears off in line of the hole.

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5. A method as set forth in claims 3 and 4, **characterized** in that the spring-loaded tongue (10) is in an operating state in engagement with the wrap film in such a way that, as the wrap film is being pulled conventionally out of the film dispenser (12), the wrap film glides along in engagement with the tongue (10) without any damage to the film.

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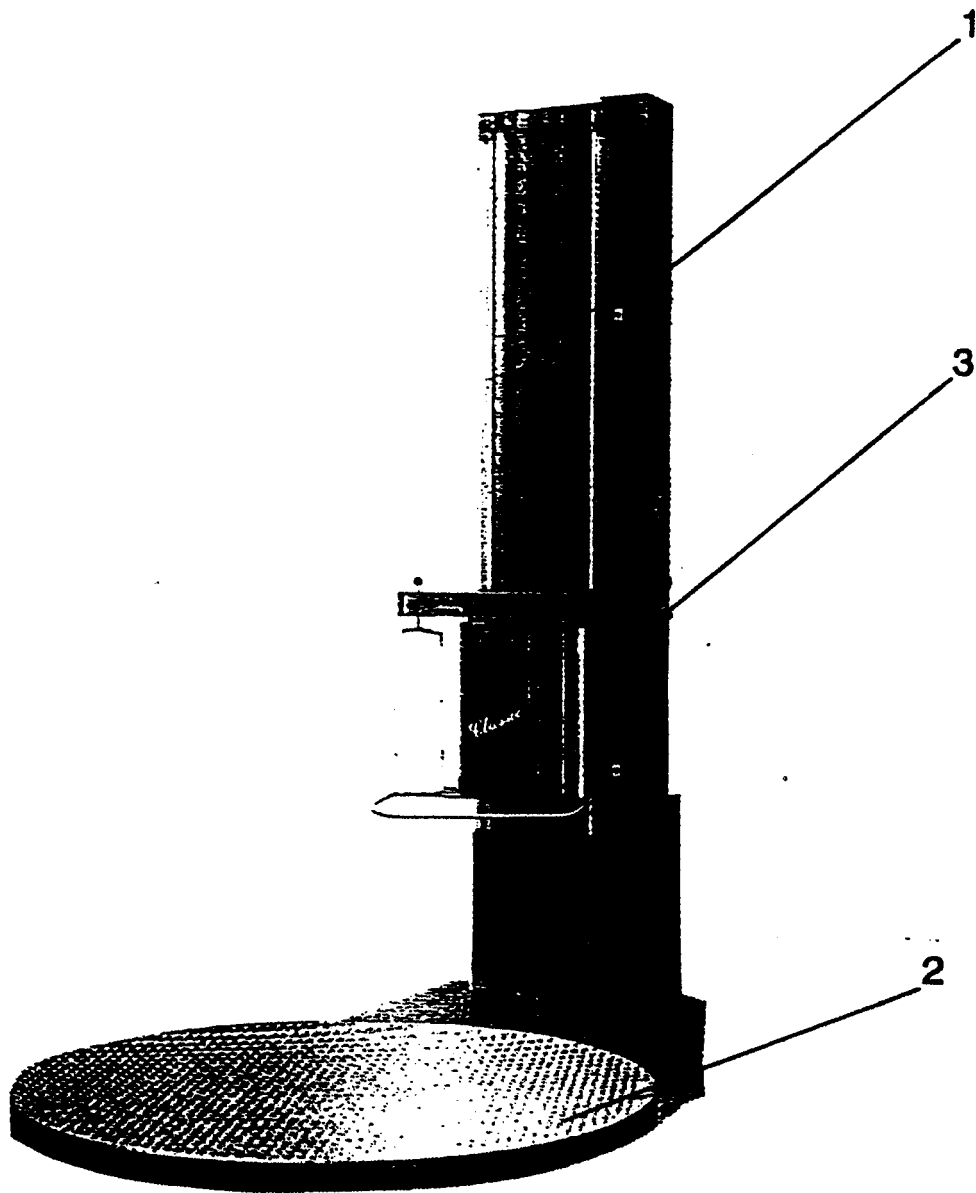


FIGURE 1

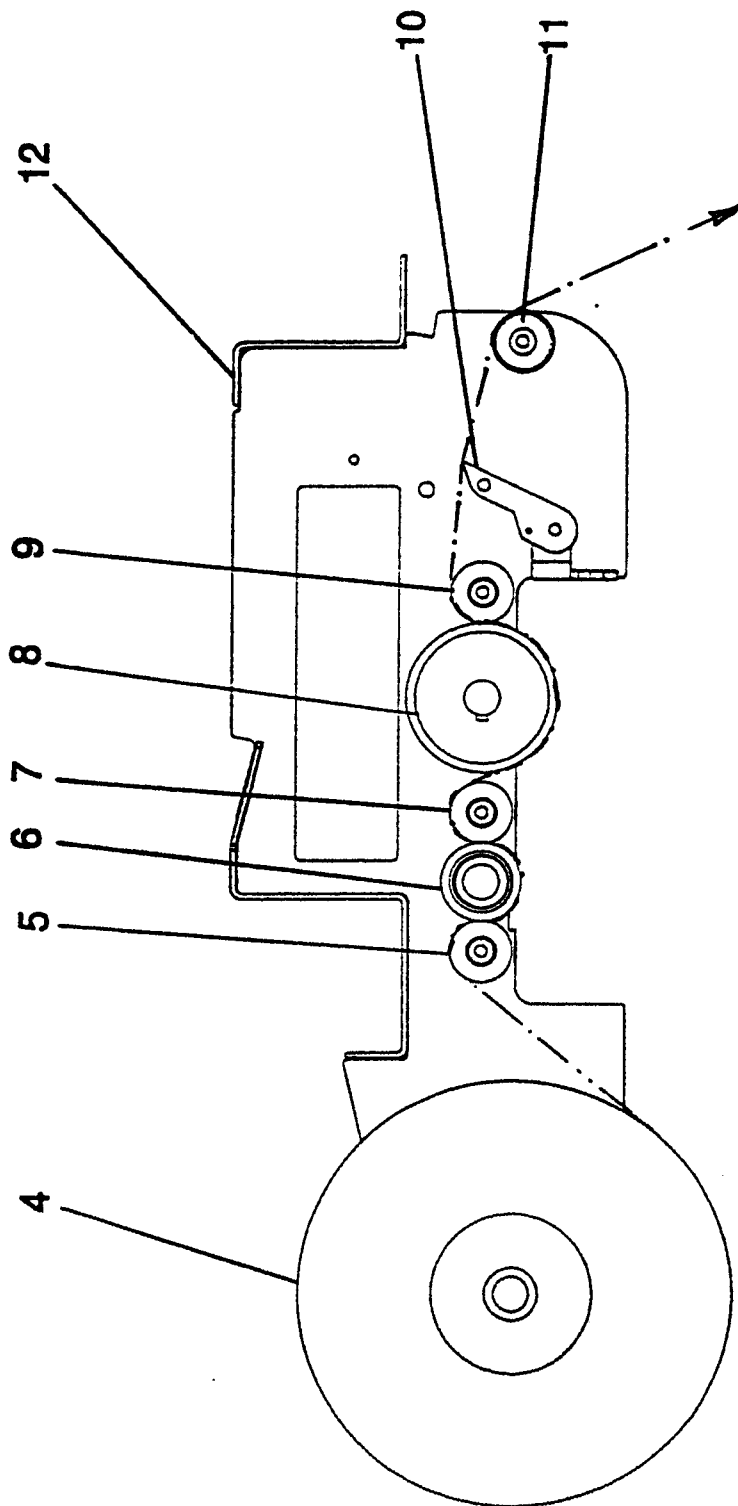


FIGURE 2

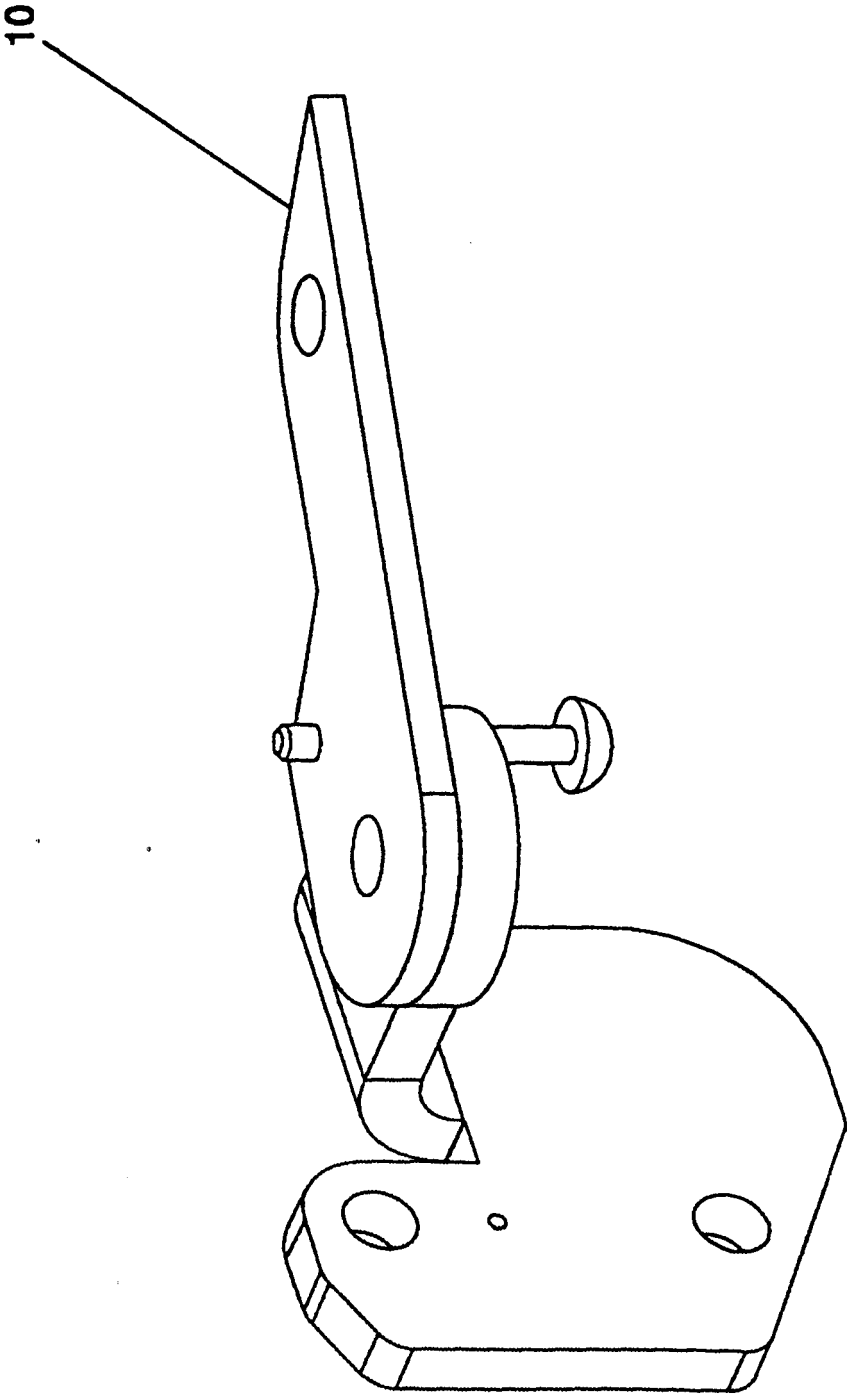


FIGURE 3

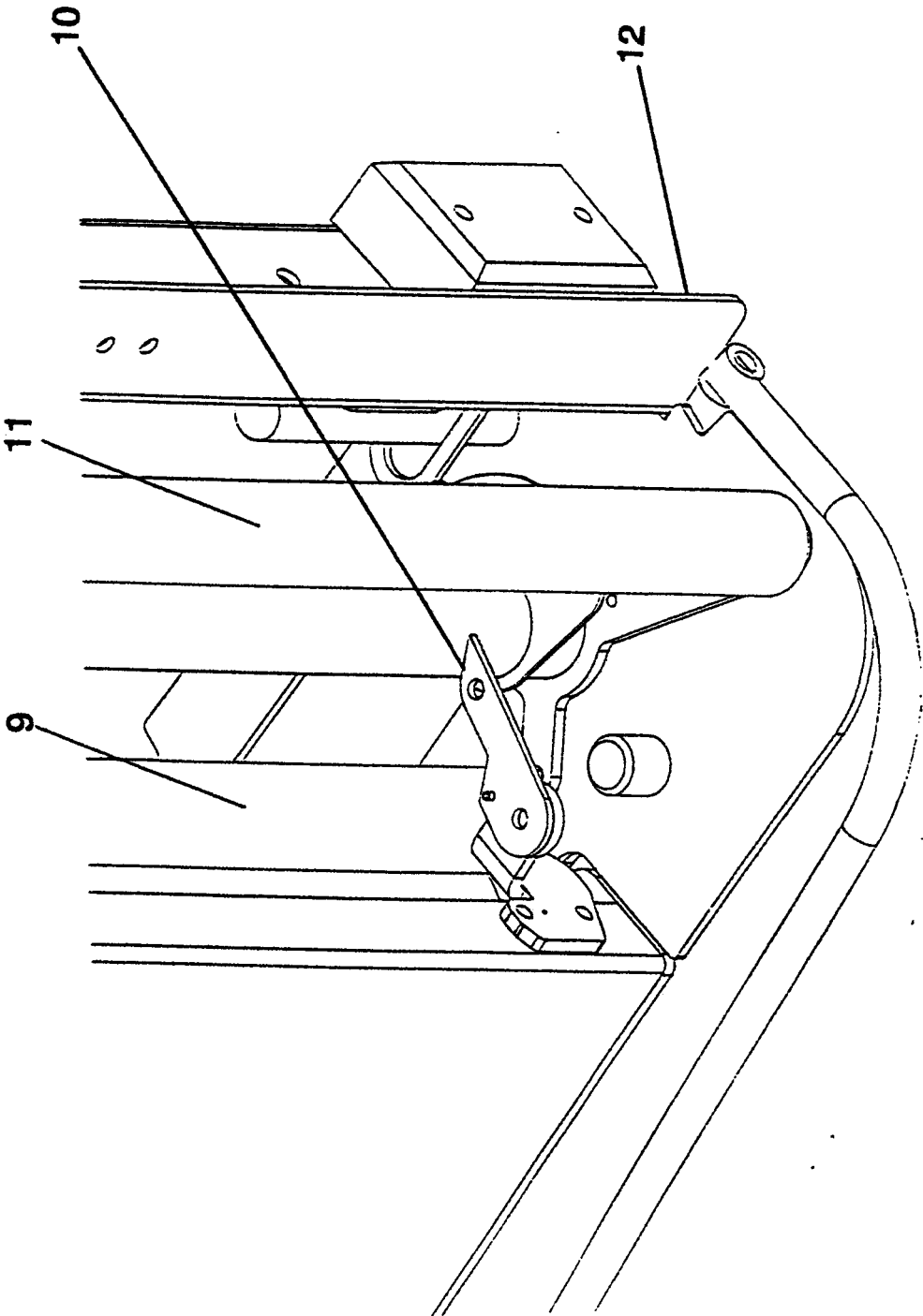


FIGURE 4



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EUROPEAN SEARCH REPORT

Application Number
EP 99 66 0182

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	EP 0 671 324 A (LANTECH INC) 13 September 1995 (1995-09-13) * column 3, line 27 - line 45 * * column 5, line 4 - column 6, line 28; figures *	1-4	B65B11/04 B65B11/02
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 12 April 2000	Examiner Jagusiak, A
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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EP 99 66 0182

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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