Office de la Propriété Intellectuelle du Canada
Un organisme d'Industrie Canada

Canadian Intellectual Property Office
An agency of Industry Canada

CA 2482676 A1 2003/11/13

(21) 2 482 676

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2003/05/02
(87) Date publication PCT/PCT Publication Date: 2003/11/13
(85) Entrée phase nationale/National Entry: 2004/10/14
(86) N° demande PCT/PCT Application No.: EP 2003/004590
(87) N° publication PCT/PCT Publication No.: 2003/093120
(30) Priorité/Priority: 2002/05/04 (102 20 058.0) DE

(51) Cl.Int.^{7}/Int.Cl.^{7} B65D 5/74, B31B 1/84

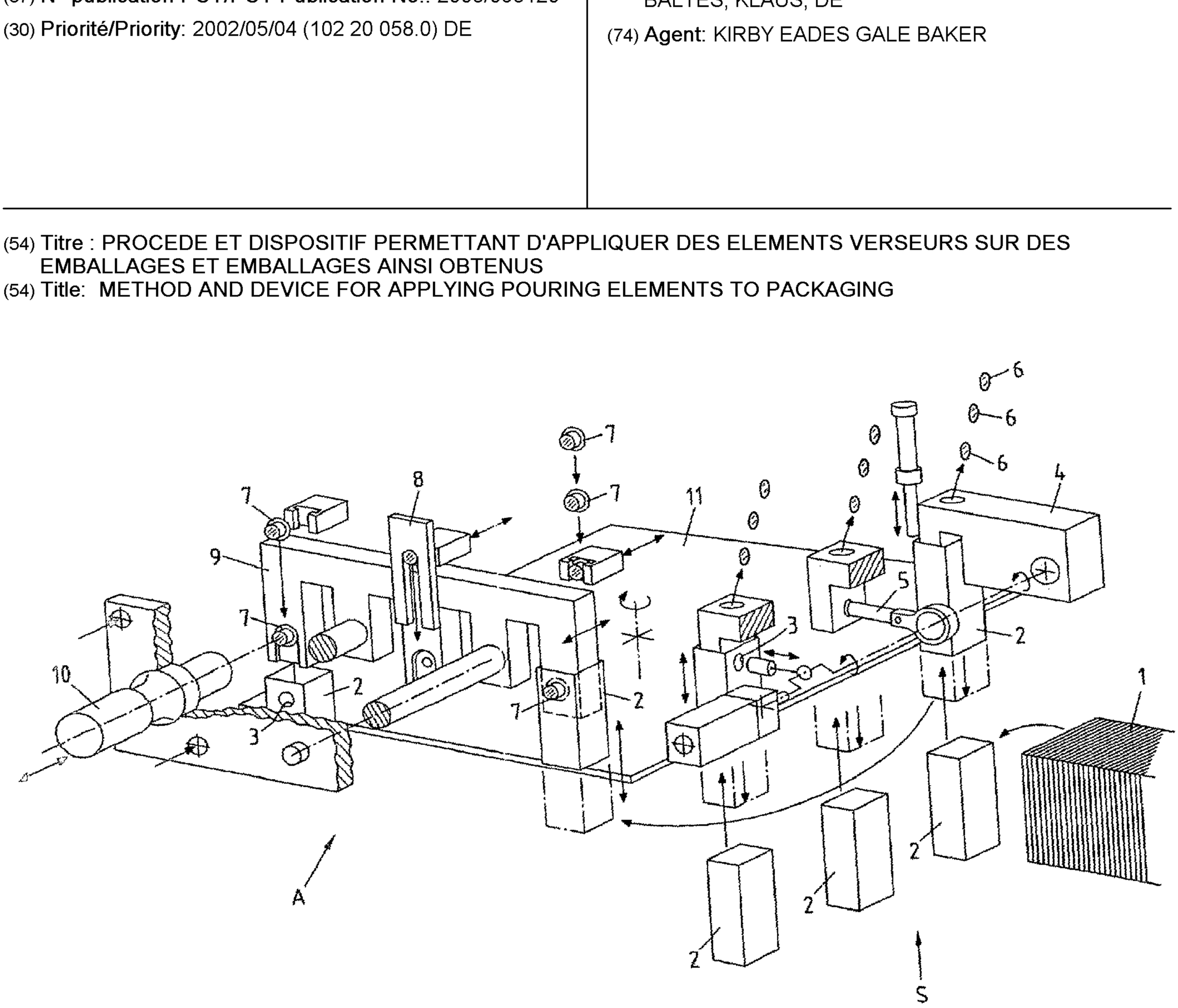
(71) Demandeur/Applicant:
SIG COMBIBLOC GMBH, DE

(72) Inventeurs/Inventors:
BREDT, HANNES, DE;
BALTES, KLAUS, DE

(74) Agent: KIRBY EADES GALE BAKER

(54) Titre : PROCEDE ET DISPOSITIF PERMETTANT D'APPLIQUER DES ELEMENTS VERSEURS SUR DES EMBALLAGES ET EMBALLAGES AINSI OBTENUS

(54) Title: METHOD AND DEVICE FOR APPLYING POURING ELEMENTS TO PACKAGING



(57) Abrégé/Abstract:
The invention relates to a method and a device for applying pouring elements (7) to packaging, in particular to parallelepipedal multi-layer composite packaging for liquids. To permit an automated application of a pouring element (7) that is to be introduced via a punched opening (3), said device is provided with a punching station (S), at which an opening (3) for receiving a pouring element (7) is punched into a supplied open tube (2), in addition to a station (A) for applying the pouring elements (7) to the openings (3) produced at the punching station (S).

A B S T R A C T

A method and a device are shown and described to apply pouring elements (7) to packages, especially to rectangular multi-layer composite packages for liquids. To facilitate an automated application of a pouring element (7) to be introduced through a stamp opening (3), a stamping station (S) is provided, where an opening (3) is stamped into a fed-in unfolded tube (2) to receive a pouring element (7), as well as a station (A) to apply the pouring elements (7) to the openings (3) prepared in the stamping station (S). If applicable, other stations (F, D) are provided for the preparation of the package bottom and the filling as well as the closing of the finished package, or for extracting packages that either have not been provided or have not been properly provided with a pouring element (7), with at least one rotatable transport means (11) that is rotated by a respective angle corresponding to the number of stations (S, A, F, D) being provided to transport at least one respective tube (2).

TH/bs 020100WO
12. Oktober 2004

METHOD AND DEVICE FOR ATTACHING POURING ELEMENTS TO PACKAGES AND PACKAGES PRODUCED ACCORDINGLY

The invention relates to a method and a device for attaching pouring elements to packages, especially square packages made of multi-layer composite material for liquids, as well as packages produced in this way.

Beverage containers that are developed as multi-layer composite packages are known in a number of forms, such as flat gable composite packages. They are used primarily as containers for liquids in connection with cold-, sterile-, hot- and aseptic contents.

To improve the handling of these composite packages and in particular to achieve the reclosability, the trend has been to provide the composite packages with reclosable pouring elements. Said pouring elements can be developed in single- or multiple parts and generally have an opening element and a lid. Today nearly all packages on the market have reclosable pouring elements. EP 0 580 593 B1, for example, discloses a multi-layer composite package with a pouring element that is used for opening the package for the first time and has for the reclosability an appropriate closing element. A notch provided in the area of the carton layer and the outer PE layer of the composite material of the package is supposed to gable the ridge material, and an opening element that is integrally connected to the pouring

element is then pressed into the notch in the package material to open the package.

Furthermore, packages are known having pouring elements with screwed closures. In that case, it is also known to apply the screwed closures to the (still closed) package, or to introduce said screwed closures through an opening in the head area of the multi-layer composite package and attach it there, usually with a flange to be connected to the interior wall. In particular with the latter pourers, it is problematic to apply the screwed-cap pouring element after the package was filled because of potential hygienic problems with the product and/or the container and/or the pourer to be attached.

It is therefore the object of the present invention to design and develop the initially mentioned and explained method as well as a corresponding device for the application of pouring elements on packages in such as way as to facilitate an automated application with a pouring element that is introduced through a stamp opening.

The object of the invention is attained by the following method with the steps:

- Feeding flat-folded package jackets,
- Separating, pre-folding, if applicable, and unfolding of the package jackets into respective rectangular tubes,

- Transporting at least one tube into a stamping station, where an opening to receive the pouring element is stamped into the tube,
- Transporting at least one tube into a station for the application of pouring elements into the openings prepared in the stamping station,
- Preparing the bottom of the package, and
- Filling and closing the finished package.

In accordance with the invention, it was found that applying the pouring element even before preparing of the bottom of the package simplifies the production process, because in the sterilization, which takes place directly prior to filling with the packages produced according to this method, the package, as well as the pouring element that was applied earlier and is firmly connected to the wall of the package, are sterilized simultaneously.

A device in accordance with the invention solves the problem with a stamping station, where an opening to receive a pouring element is stamped into a delivered and unfolded tube, a station to apply the pouring elements in the openings produced in the stamping station, as well as, if applicable, other stations for preparing the package bottom and filling as well as closing the finished package, with a rotatable transport means being provided for the transport of at least one tube which, depending on the number of stations, is respectively rotated around an angle.

The rotatable transport means allows the simultaneous processing of a plurality of package jackets, which pass through several stations.

In another embodiment of the invention, the pouring elements are screwed closures, with the screwed closures usefully being applied with already attached threaded lids. This means that the stamped opening in the package has a diameter that essentially corresponds to the outer diameter of the threaded lid. To attach the pouring elements, said elements have a flange that is connected to the interior side of the package, preferably glued or welded all-over.

In another advantageous embodiment of the invention, a further station is provided to transfer the tubes provided with the pouring element to downstream units. A transfer means may be provided for this purpose, which supplies the tubes pivoted around an axis by 180° to a mandrel wheel, where the bottom of the package is prepared.

In another teaching of the invention it is provided that another station serves to extract tubes where the pouring element was not attached or not attached properly. The tubes that were not properly processed may remain on the transport means until they arrive at the extraction station, where they are removed from the transport means with mechanical or pneumatic means.

Especially preferably, the transport means has four stations, with each station having a plurality of

receiving means for the respective processing. It is advantageous if the receiving means are arranged along the outer sides of a square on the transport means.

To transfer the package blanks to the transport means in unfolded condition, the transport means has an upstream means to unfold the package jackets into tubes.

Finally, the invention relates to a package, especially a rectangular package of composite carton, having a pouring element with a fastening flange, especially a reclosable screwed closure with a threaded cap, produced in accordance with the aforementioned method. It is useful to apply the pouring element at the inner side of the tube such that the flange of the pouring element ends essentially flush with the inner wall of the tube. In this way, the package tube, which is already equipped with the pouring element, can be processed further on a mandrel by drawing the open package tube with the attached pouring element over a mandrel to seal the bottom of the package.

The invention is explained in the following with an illustration that represents only one preferred embodiment. The illustration shows in

Fig. 1 schematically a device in accordance with the invention in perspective view in the direction of the flow of the material and

Fig. 2 schematically, the device in accordance with the invention in Fig. 1 in another perspective view against the flow of the material.

The sequence of the method in accordance with the invention can be described as follows:

Fig. 1 shows that in a stamping station S, a plurality of flat folded package jackets 1 are fed to an unfolding station (not shown), from where the package jackets, which are formed into respective rectangular tubes 2, are transferred to a stamping unit 4 to prepare a stamp opening 3, with a stamp plunger 5 precisely positioning and making the stamp opening 3. The slugs 6 of the multi-layer composite are also removed from the stamping units 4 in said stamping station S.

Then the package tubes 2 having a stamp opening 3 are fed to a station A to apply the pouring elements 7.

The feed of the pouring elements 7 is effected in station A by feed rails (not shown), with a plunger 8 transferring the pouring element 7 located at the end of the fed pouring elements 7 to a tool 9, which introduces the respective pouring element 7 into the package tube 2 and inserts the pouring element 7 from the inside through the punch opening 3 toward the outside.

Then the tool 9 serves as an anvil for the welding process. In the subsequent welding process, the flange of the pouring element 7 is welded to the multi-layer composite material that borders the stamp opening 3 by

axially delivering a sonotrode 10 that has an opening to receive the treaded cap.

In the shown and insofar preferred embodiment, the transfer of the package tubes 2 from station A and/or S to the stations F and/or D occurs by means of a transport means 11, which is developed as a square rotary table. On the outsides of said rotary table, receiving means, which are not described in detail, are provided to receive the three tubes 2 in the shown embodiment on one side. The package tubes 2 are then fed from the station A, where the pouring elements 7 were applied, to the transport means 11 of station F with another 90° rotation, with said station F delivering the package tubes 2 to downstream means for the preparation of the package bottom and the filling as well as the closing of the finished package.

To that end, the package tubes 2 shown in the embodiment in Fig. 2 are pivoted around a horizontal axis 12 by 180° by means of a transfer means and drawn on the mandrel of a mandrel wheel 13, with only two parallel mandrels of the mandrel wheel 13 being shown for clarity.

It is especially useful if the package tubes 2, which are still taken up by the transport means 11 are inspected by an appropriately developed sensor 14 before being transferred to check if the pouring elements were applied properly. If the sensor 14 detects tubes 2 where the pouring element was not applied at all or not applied properly, said tubes remain in the transport means 11 and are fed with another 90° rotation to a station D to extract the rejects. This is shown schematically with the

package tube 2' in Fig. 2. Piston/cylinder units 15 (shown only schematically) can be used for the extraction.

It becomes quickly obvious that the device in accordance with the invention is constructed so as to save space and can work at a relatively fast cycle rate due to the respective 90° rotations. In doing so, the processing tools arranged on the periphery remain stationary, so that only relatively small masses have to be moved for the transfer of the tubes 2.

TH/bs 020100WO
12. Oktober 2004

C L A I M S

1. A method for applying pouring elements to packages, especially to rectangular multi-layer composite packages for liquids, characterized by the following steps:

   - Feeding of flat-folded package jackets (1),
   - Separating, pre-folding, if applicable, and unfolding of the package jackets (1) into a respective rectangular tube (2),
   - Transporting at least one tube (2) to a stamping station (S) where an opening (3) to receive the pouring element (7) is stamped into the tube (2),
   - Transporting at least one tube (2) to a station (A) for applying pouring elements (7) into the openings (3) prepared in the stamping station (S),
   - Preparing the package bottom, and
   - Filling and closure of the finished package.

2. The method according to claim 1, characterized in that the pouring elements (7) are screwed closures.

3. The method according to claim 2, characterized in that the respective screwed closures are applied with the threaded lid already screwed on.

4. The method according to one of the claims 1 to 3, characterized in that the pouring elements have a respective flange that is glued all-over to the interior side of the package.

5. The method according to one of the claims 1 to 3, characterized in that the pouring elements have a respective flange that is welded all-over to the interior side of the package.

6. A device for applying pouring elements to packages, especially to rectangular multi-layer composite packages for liquids, characterized by a stamping station (S) where an opening (3) to receive a pouring element (7) is stamped into a fed-in unfolded tube (2), a station (A) for applying the pouring elements (7) to the openings (3) prepared in the stamping station (S) as well as, if applicable, other stations for preparing the package bottom and filling as well as closing of the finished package, with a rotatable transport means (11) that is rotated around a respective angle corresponding to the number of stations being provided for the transport of at least one respective tube (2).

7. The device according to claim 6, characterized in that an additional station (F) is provided to transfer the tubes (2) having a pouring element (7) to downstream units.

8. The device according to claim 7, characterized in that the downstream unit is provided as a transfer unit to pivot the tubes around a horizontal axis (12) by 180° and feed said tubes to a mandrel wheel (13) where the bottom of the package is formed.

9. The device according to one of the claims 6 to 8, characterized in that an additional station (D) is provided to extract the tubes (2) that were either not provided with a pouring element (7) or not properly provided with a pouring element (7).

10. The device according to one of the claims 6 to 9, characterized in that each station (S, A, F, D) has a plurality of receiving means to receive a plurality of tubes (2).

11. The device according to claim 10, characterized in that the transport means (11) has four stations (S, A, F, D).

12. The device according to one of the claims 9 to 11, characterized in that each station (S, A, F, D) has a plurality of receiving means.

13. The device according to claim 11 or 12, characterized in that the receiving means are arranged on the transport means (11) along the outer sides of a square.

14. The device according to one of the claims 6 to 13, characterized in that the transport means (11) has at least one upstream means to unfold the package jackets (1) into tubes (2).

15. A package, especially rectangular multi-layer composite package with a pouring element (7) having a fastening flange, especially a screwed closure that can be resealed with a threaded cap, produced according to the method in accordance with one of the claims 1 to 5.

16. The package according to claim 15, characterized in that the pouring element (7) is applied at the interior side of the tube (2) in such a way that the flange of the pouring element (7) ends essentially flush with the interior wall of the tube (2).

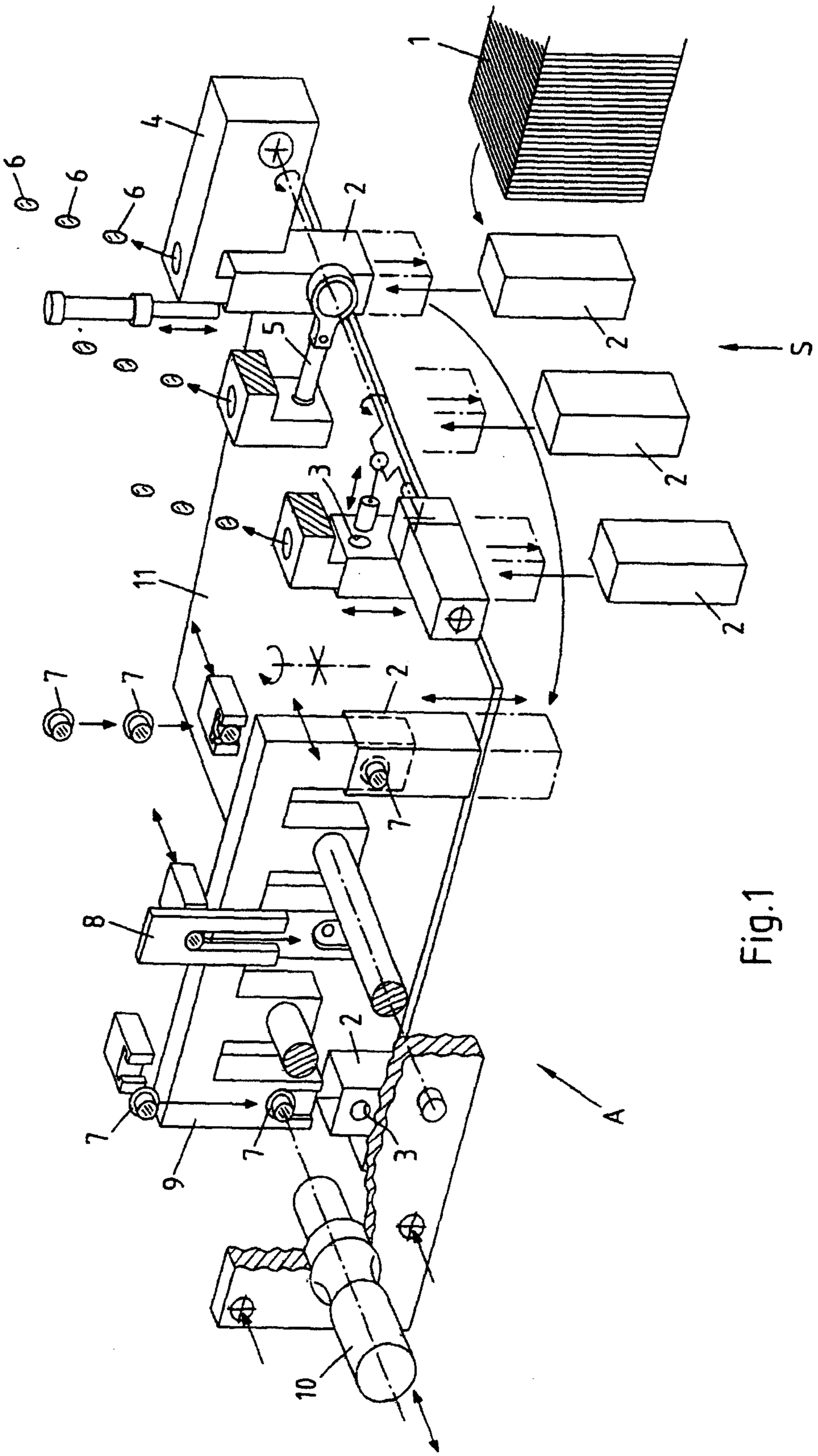


Fig.1

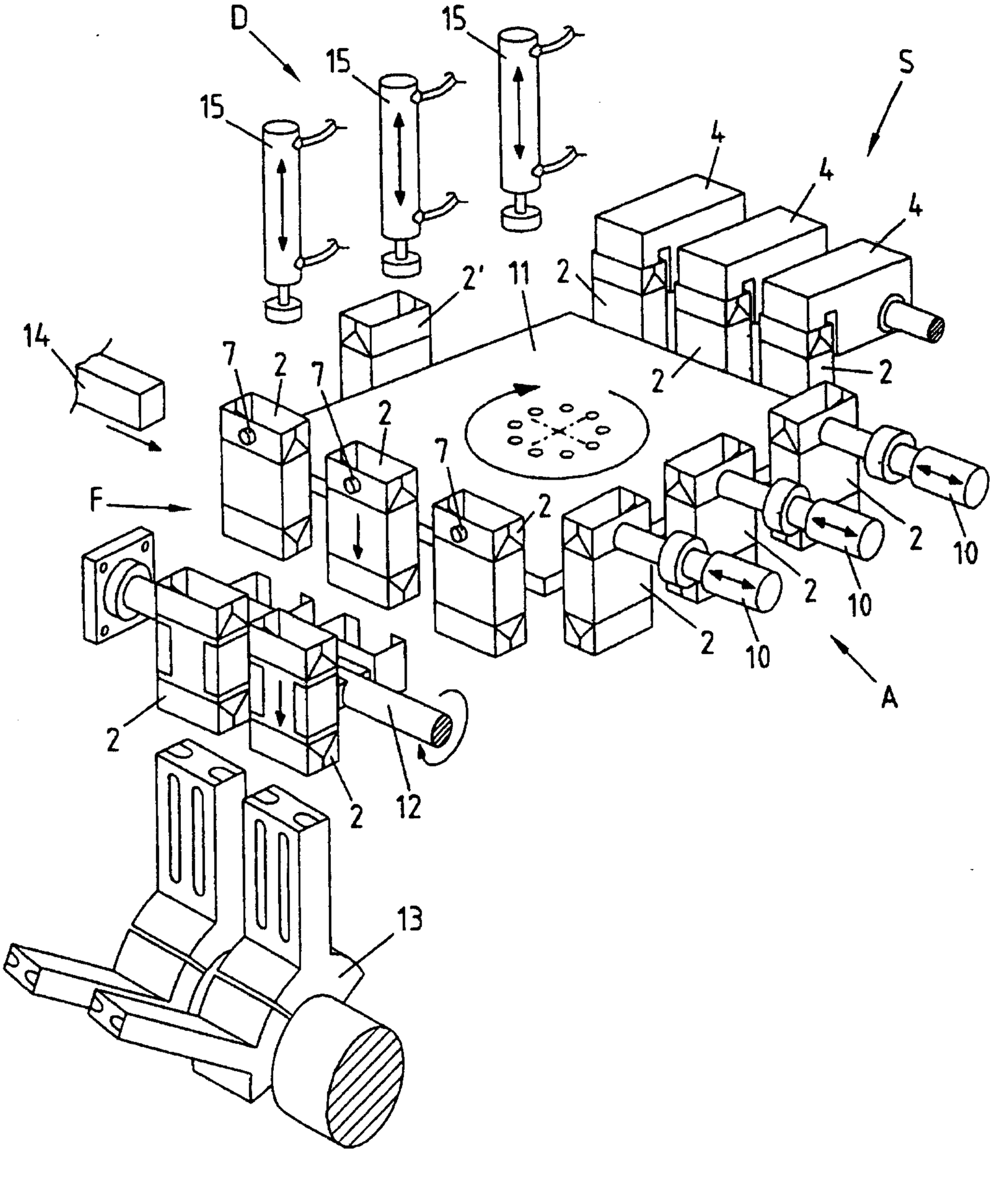
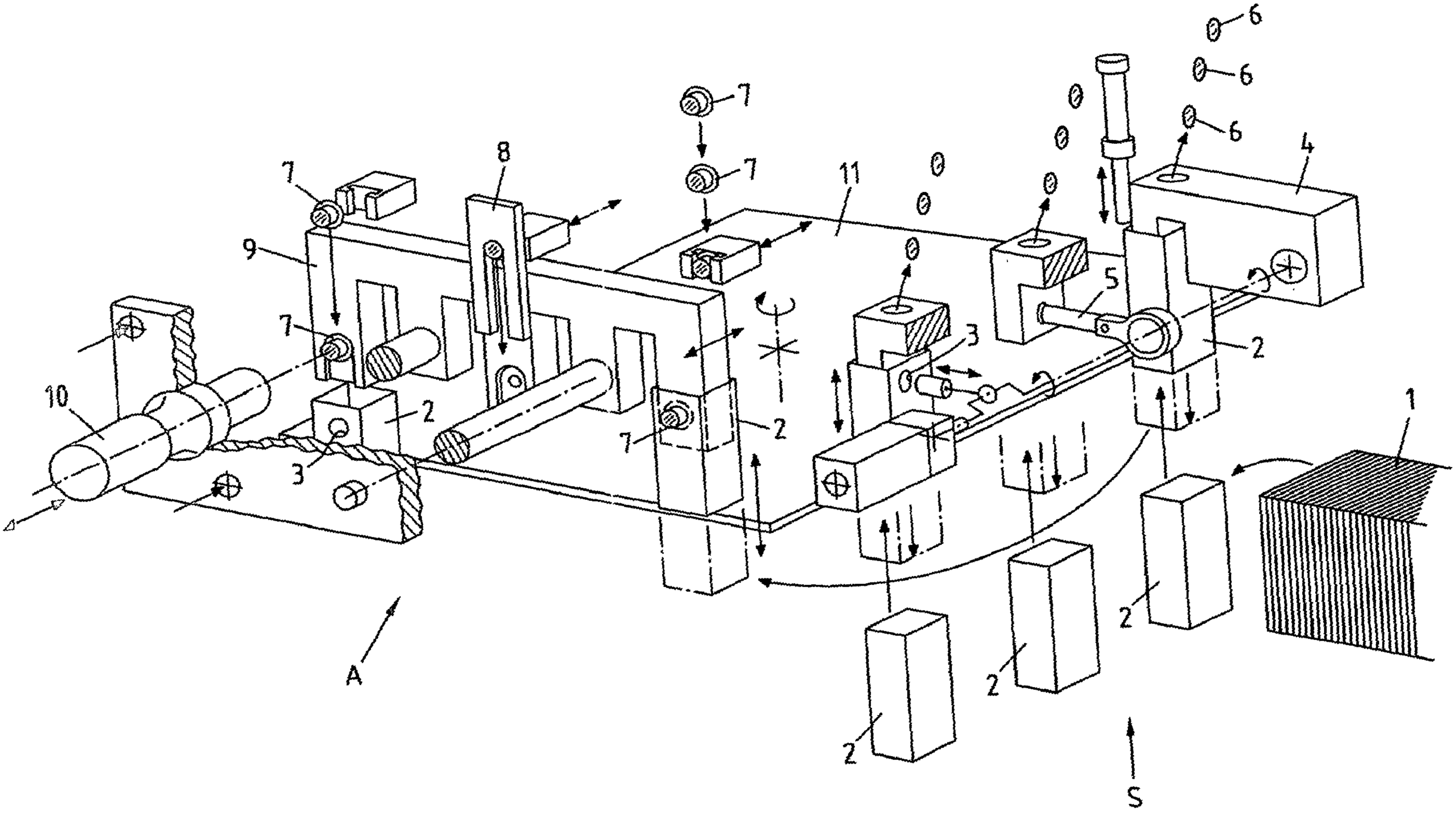


Fig.2


6
6
6
7
7
7
8
9
11
4
5
3
2
10
1
A
S