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(54) **Machine for working cardboard and similar**

(57) A machine for cardboard working (C) and similar, is provided with cardboard advancing means and a set of operative elements (2) fit to make cuts, creases or other cardboard workings.

The machine (1) comprises support means (3) for the cardboard, opposite to the operative elements (2) with respect to the cardboard (C) and equipped with a plurality of bristle means (4) fit to support the cardboard during the operation of said operative elements (2).

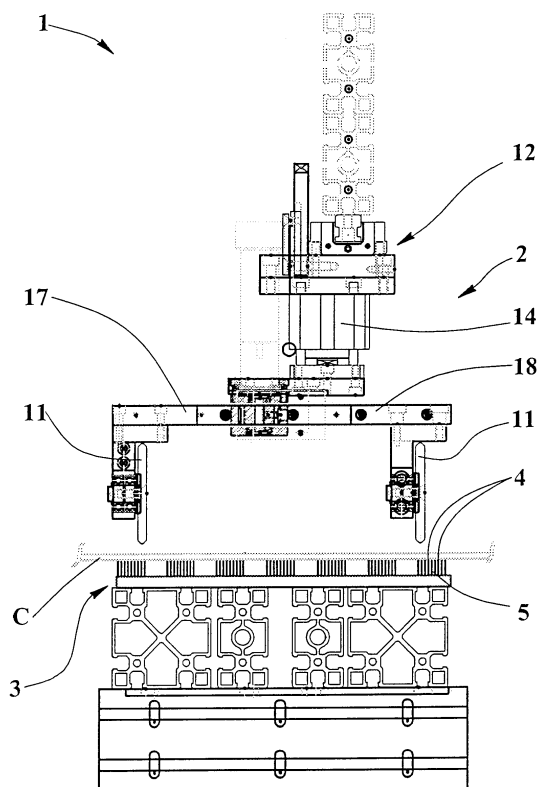


FIG.5

Description

[0001] The present invention relates to technical field concerning the cardboard working and refers to machine for cardboard working and similar, in particular for carrying out cuts, creasing and similar in plates, tapes or sheets of waved cardboard or in a single layer.

[0002] Known machines for working cardboard having disc, blade means or similar in order to carry out cuts, creasing, pre-fractured outlined cuts, longitudinal and cross-sectional cuts.

[0003] Such known machines are equipped with stop means opposite to the disc cutting or punching means with respect to the cardboard to be worked. Such known stop means, generally having a roll, prevent the deformations or excessive folds of the cardboard subjected to forces with components perpendicular to cut means.

[0004] In order to prevent excessive frictions, said known stop means, must be rotated to a speed corresponding to the cardboard translation speed or must be placed at the same rotation speed of cut means.

[0005] A disadvantage of such machines with known stop means, consists in the fact that they are complex, heavy and expensive.

[0006] Other disadvantage consists in the fact that inertia of the known roll stop means, reduces the accelerations and reduces the mean operative speed of the known machines.

[0007] An object of the present invention is to propose a simple, light, economic and reliable machine for cardboard working provided with cardboard cutting and/or punching means.

[0008] Another object is to propose a machine with reduced moving masses and fit to operate in a very high mean operative speed.

[0009] Another object is to propose a machine very efficient, with low energy absorption.

[0010] The above mentioned objects are obtained according to the content of the claims.

[0011] The characteristics of the present invention are evidenced in the continuation with particular reference to the attached drawings, in which:

- figure 1 shows a partial plant view of the machine for cardboard working, object of the present invention;
- figures 2-4 show views in the inlet direction of the machine of figure 1 with an operative assembly at respective rest, punching and cutting conditions;
- figure 5 shows a section view according to plane V - V of figure 1.

[0012] With reference to figures 1-5, numeral 1 indicates the machine for working the cardboard C and similar, object of the present invention.

[0013] The machine 1 is equipped with advancing means of the cardboard, known and not illustrated, and an assembly of operative elements 2 fit for making cuts,

creasing or other workings of the cardboard.

[0014] Each operating element 2 comprises two free disc cutting means 10 and two free disc creasing means 11, fit to make cuts and cross-sectional or longitudinal creasing of cardboard C, in such way that the cutting means 10 and the creasing means 11 operate on cardboard C in longitudinal and/or cross-sectional direction along the advance direction of the same cardboard.

[0015] The two cutting means 10 are fixed, in free rotating way, to the free ends of the respective first arms 15, 16, parallels and activated along axial translation, by first drive means, i.e. motorized pinion and rack, for regulating the mutual distance between the two cutting means 10 along the cardboard movement direction.

[0016] The two creasing means 11 are fixed, in free rotating way, to the free ends of corresponding second mobile arms 17, 18, parallels and activated along axial translation by second actuating means in order to regulate the mutual distance between such creasing means 11 along the cardboard movement direction.

[0017] The actuating means of the mobile arms respectively first 15, 16 and second 17, 18 are connected through corresponding actuators 13, 14 to at least a carriage means 12.

[0018] The actuators 13, 14, i.e. of pneumatic cylinder type, are fit to move independently the cutting means 10 and the creasing means 11 orthogonally to the sliding plane of the cardboard, between respective rest and operating conditions in which they are distanced and interfering with the cardboard C in order to cut or crease this latter.

[0019] The carriage means 12 is motorized and translates, in controlled way, along a cross-sectional beam 20 in order to move the cutting means 10 and the creasing means 11 transversally to the cardboard movement.

[0020] The device 1 comprises support means 3 for the cardboard, opposite to the operative elements 2 with respect to the cardboard C, and equipped with a plurality of bristle means 4 fit to support the cardboard during the actuation of said operative elements 2.

[0021] The orthogonally applied forces to cardboard by the operative elements 2 are contrasted by opposite reaction forces produced by the bristle means and fit to prevent flexions and excessive cardboard deformations during cutting or creasing thereof

[0022] The free tips of the bristle means 4 define the advancing plane of the cardboard and support this latter.

[0023] Preferably, and as illustrated in figures, the bristle means 4 are collected in brushes 5 regularly distributed on the upper surface of a rigid plane of the support means 3.

[0024] The free tips of bristle means 4 of each brush 5 are placed on a plane almost coinciding with the advancing plane of the cardboard.

[0025] Alternatively, the free tips of bristle means 4 of each brush can be disposed on a plane lightly tilted, according to the cardboard advancing direction, with respect to the advancing cardboard plane in order to reduce

the cardboard blocking risks particularly in the case of longitudinal cuts made by the operative elements.

[0026] The bristle means 4 are made of filiform nylon or other synthetic material segments with diameter cross section ranging from 0,1 to 4,0 millimetres depending on the bristle number for each surface unit and on vertical charges to be supported.

[0027] The portion of support means 3 having bristle means, extends at least 30 millimetres upstream and downstream, with respect to the cardboard movement, beyond the workspace of the operative elements 2 in order to avoid undesired flexions of bristles and cardboard at edges of the support means 3.

[0028] The operation of the machine provides that, due to the action of the advancing means, the cardboard advances on the support means 3 with low friction due to the support supplied by the bristle means tips which, as seen, are fit to supply longitudinal sufficient forces of reaction to prevent cardboard deformations during the operations carried out by the operative elements 2.

[0029] An advantage of the present invention is to propose a simple, light, economic and reliable machine for cardboard working provided with cardboard cutting and/or punching means.

[0030] Another advantage is to propose a machine with reduced moving masses and fit to operate in a very high mean operative speed.

[0031] Another advantage is to propose a machine very efficient, with low energy absorption.

Claims

1. Machine for cardboard working (C) and similar, comprising cardboard advancing means and operative elements (2) fit to make cardboard cuts, creases or other workings, **characterized in that** comprises support means (3) for the cardboard, opposite to the operative elements (2) with respect to the cardboard (C) and comprising a plurality of bristle means (4) fit to support the cardboard during the operation of said operative elements (2).
2. Machine according to claim 1 **characterized in that** the free tips of bristle means (4) define an advancing plane of the cardboard and support this latter.
3. Machine according to claim 1 **characterized in that** the bristle means (4) are collected in a plurality of brushes (5).
4. Machine according to claims 2 and 3 **characterized in that** the free tips of bristle means (4) of each brush are placed on a plane almost coinciding with the advancing cardboard plane.
5. Machine according to claims 2 and 3 **characterized in that** the free tips of bristle means (4) of each brush

are placed on a lightly tilted plane, according to the advance direction, with respect to the advancing cardboard plane.

6. Machine according to claim 1 **characterized in that** the bristle means (4) are constituted by filiform nylon or other synthetic material segments.
7. Machine according to claim 6 **characterized in that** each bristle means (4) has a cross diameter section ranging from 0,1 to 4,0 millimetres.
8. Machine according to claim 1 **characterized in that** the portion of support means (3) having the bristle means, extends at least 30 millimetres upstream and downstream, with respect to the cardboard movement, of the workspace of the operative elements (2).
9. Machine according to claim 1 **characterized in that** the operative elements (2) comprise at least a cutting means (10) and/or a creasing means (11).
10. Machine according to claim 9 **characterized in that** the cutting means (10) and the creasing means (11) are preferably of free disc type.
11. Machine according to claim 9 **characterized in that** cutting means (10) and creasing means (11) are connected to at least a carriage means (12) translating in controlled way transversally to the advancing cardboard direction.
12. Machine according to claim 9 **characterized in that** cutting means (10) and creasing means (11) operate on the cardboard (C) in longitudinal and/or transversal direction with respect to the advancing cardboard direction.
13. Machine according to claim 11 **characterized in that** cutting means (10) and creasing means (11) are connected to at least a carriage means (12) by corresponding actuators (13, 14) fit to move each cutting means (10) and creasing means (11) orthogonally to the sliding cardboard, between rest and operative conditions in which they are respectively spaced and interfering with the cardboard (C).
14. Machine according to claim 11 **characterized in that** each carriage (12) has a couple of first mobile arms (15, 16) for regulating the distance in the cardboard movement direction, between two respective cutting means (10) and is provided with a couple of second mobile arms (17, 18) for regulating the distance in the cardboard movement direction, between two respective creasing means (11).
15. Machine according to claims 12 and 13 **characterized in that** the first mobile arms (15, 16) and the

second mobile arms (17, 18) are connected to the carriage by said respective actuators (13, 14).

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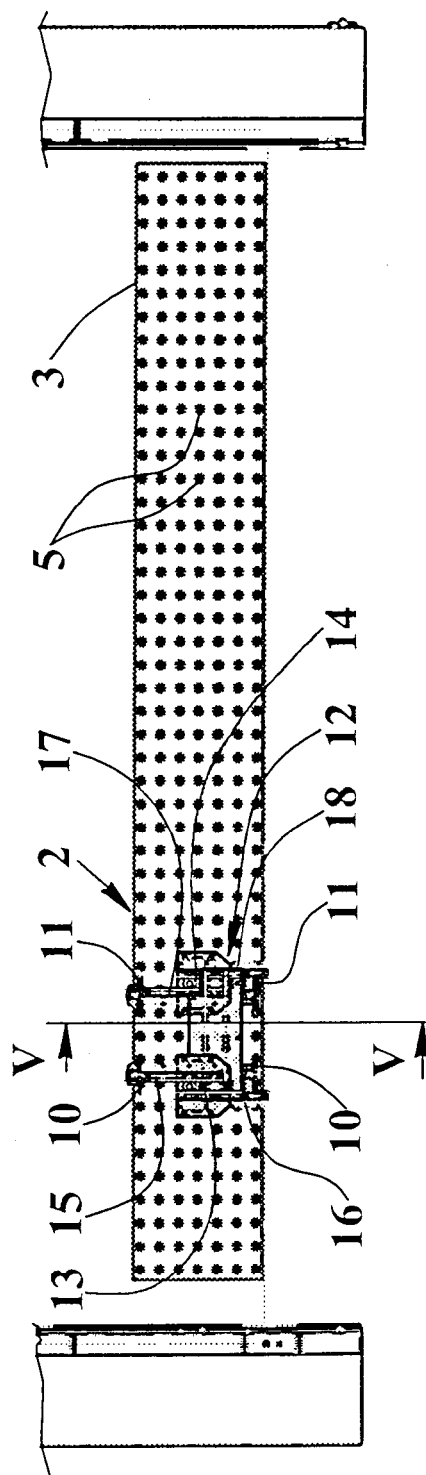


FIG.1

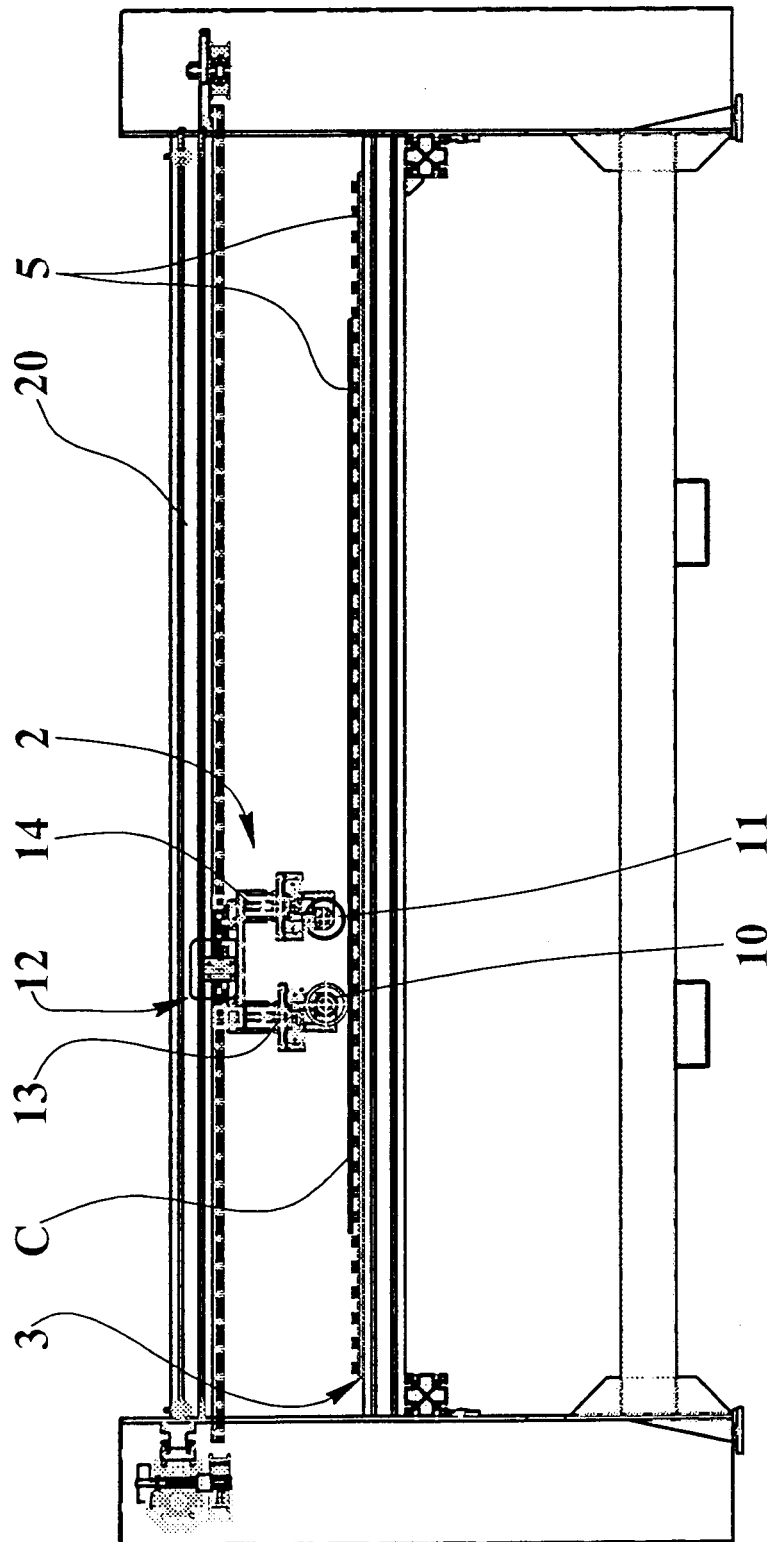


FIG. 2

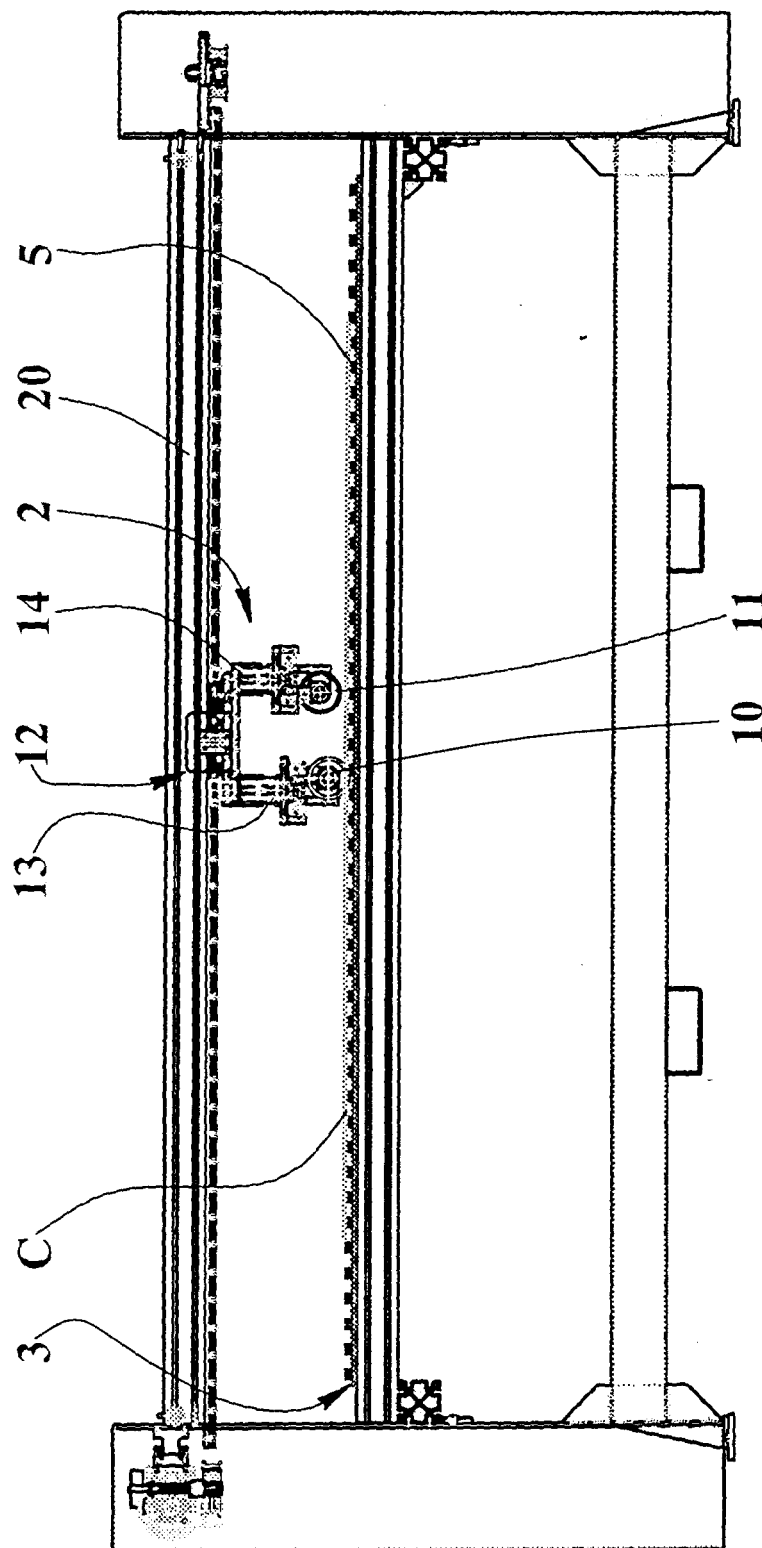


FIG. 3

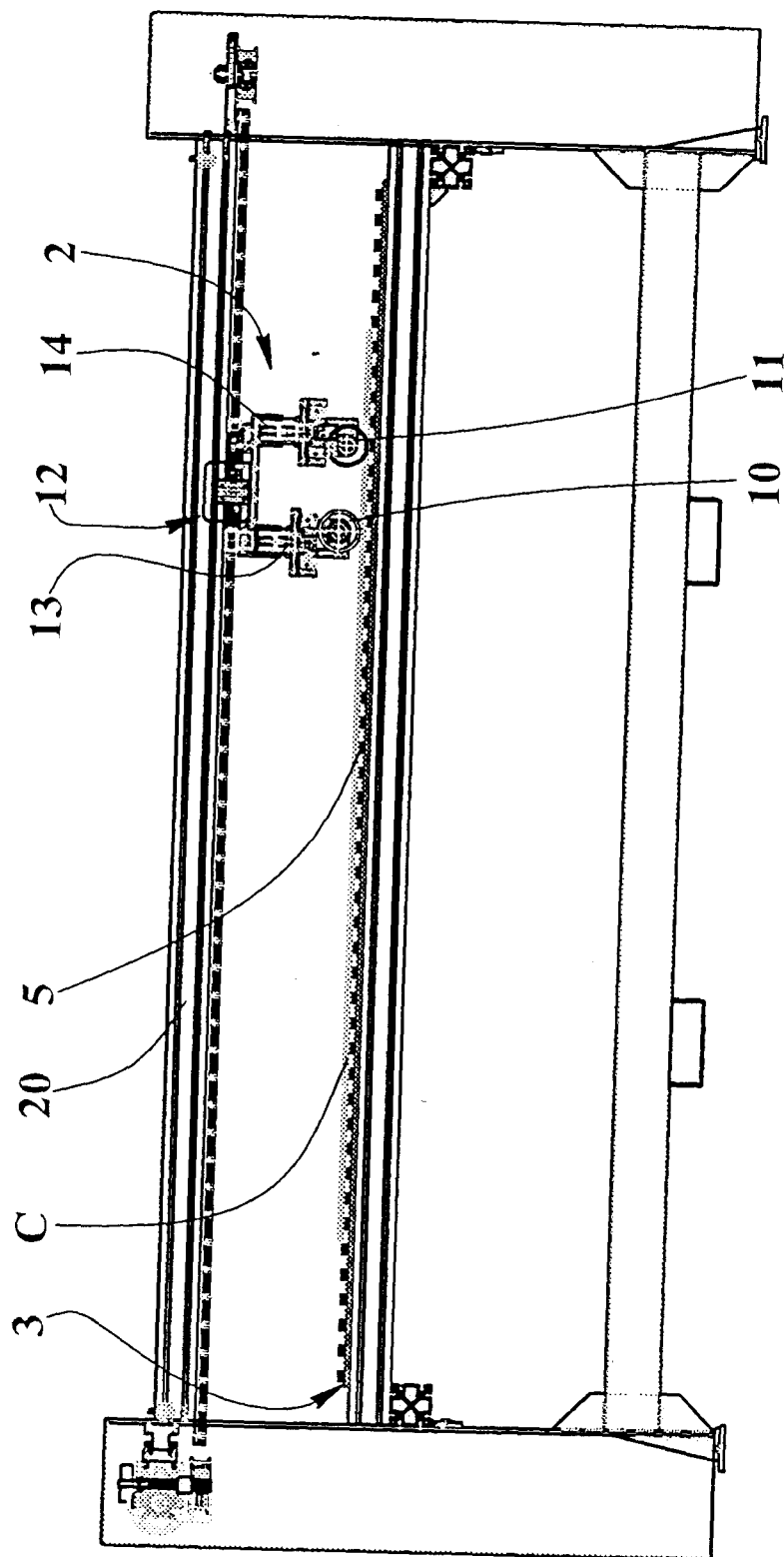


FIG.4

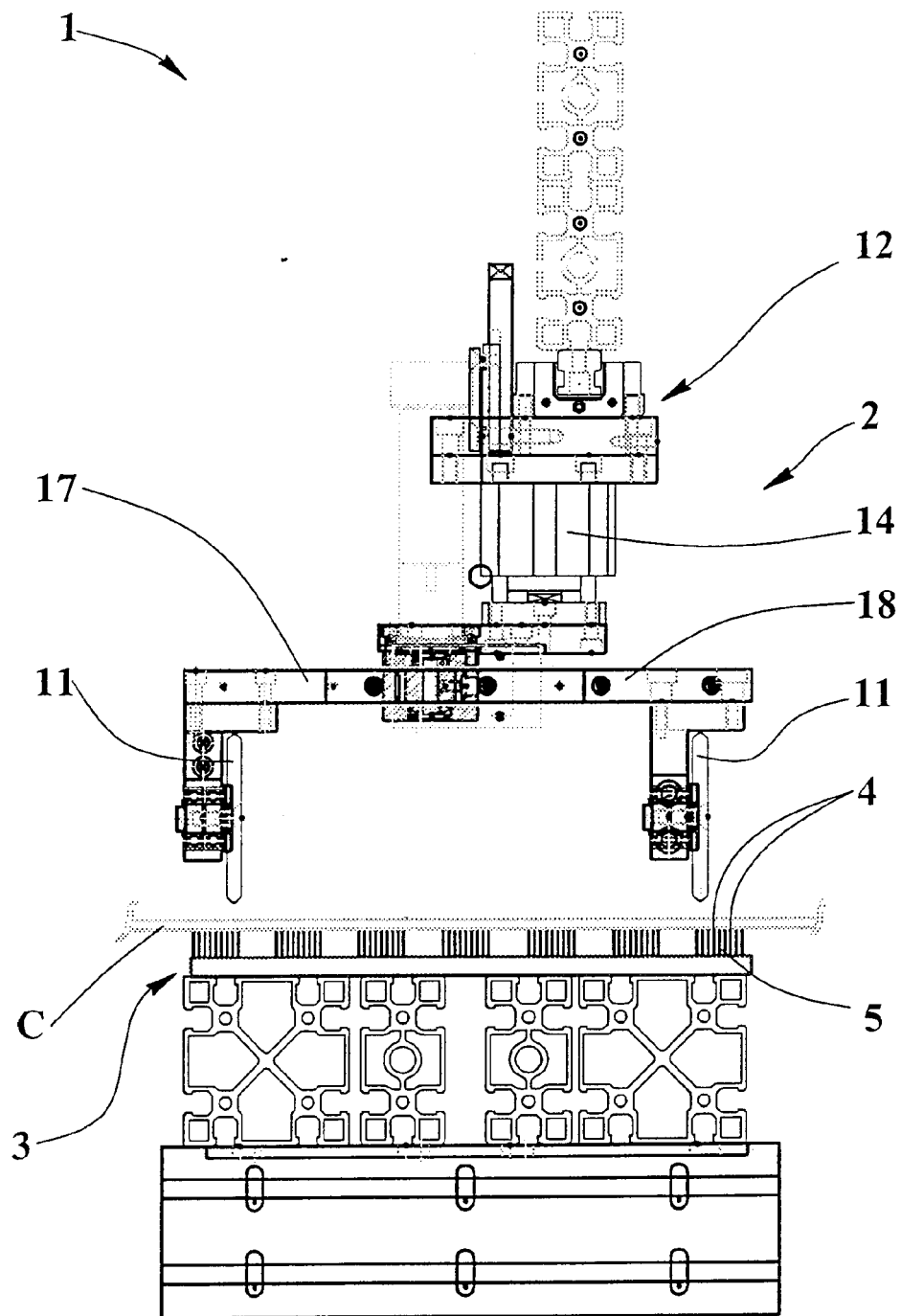


FIG.5