



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
12.11.2008 Bulletin 2008/46

(51) Int Cl.:
B31B 1/25 (2006.01)

(21) Application number: **08155932.0**

(22) Date of filing: **08.05.2008**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR
Designated Extension States:
AL BA MK RS

(71) Applicant: **L.C.R. MACCHINE AUTOMATICHE S.R.L.**
40050 Castello d'Argile, BO (IT)

(72) Inventor: **Lorenzoni, Remo**
40050 Castello d'Argile (BO) (IT)

(30) Priority: **10.05.2007 IT BO20070348**

(74) Representative: **Negrini, Elena**
Agazzani & Associati S.r.l.
Via dell'Angelo Custode 11/6
40141 Bologna (IT)

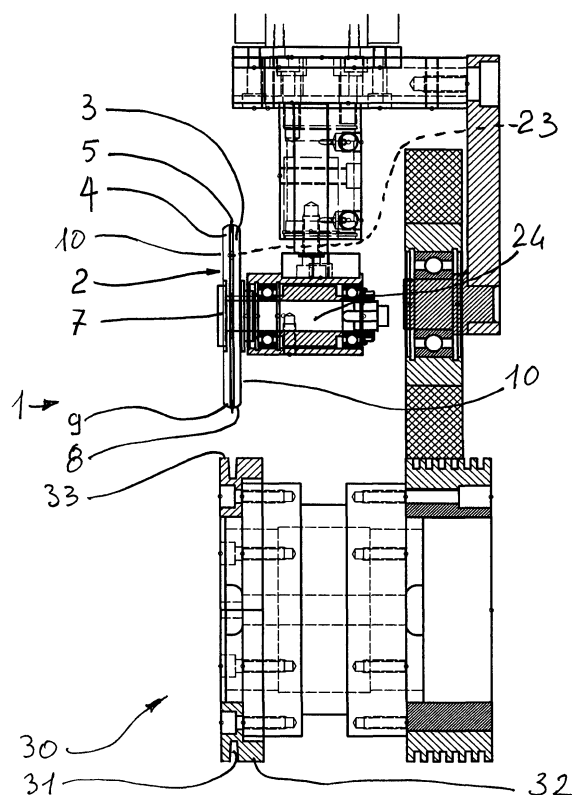
(54) **Device for carrying out creases**

(57) A device for carrying out creases fit for a machine (M) for working a cardboard sheet or similar and comprising a tool (2) of a disc shape.

The tool (2) comprises at least a side disc means (3, 4) and a circular blade means (5) fixed protruding to the at least side disc means (3, 4).

The peripheral edges of said at least a side disc means (3, 4) and of a circular blade means (5) being fit to carry out a crease with cuts on the sheet matching by pressure a face thereof.

FIG.3



Description

[0001] The present invention refers to the field concerning the working of the paper by-products and of the similar products and it refers to a device for carrying out creases in particular for carrying out packages made of corrugated cardboard.

[0002] There are known crease devices comprising a disc-like tool acting in compression onto a face of a cardboard sheet in a relative motion in respect thereto, in order to compress a generally rectilinear portion thereof, while the opposite face of the sheet is supported, at least corresponding to the tool, by a contrasting support of the device.

[0003] The perimetrical edge of the disc like tool has a transversal section having a smoothed vertex shape, circular, elliptical, ogival, or similar, suitable for compressing the cardboard along a trajectory made by the tool during the relative motion, carrying out a crease fit to make easy the folding of the sheet along itself.

[0004] A drawback of said known devices consists in that, despite the fact that the crease locally reduces the flexion resistance of the sheet, the application to the sheet of localized flexion forces, does not cause the folding along the crease but, vice versa, according to irregular and unwanted paths.

[0005] Said disadvantageous phenomenon occurs very frequently when an operator try to fold manually a sheet of great length along a longitudinal crease.

[0006] An object of the present invention is to propose a device for carrying out crease, also very long, which allow to fold comfortably the sheet onto which they have been realized.

[0007] The characteristics of the invention are highlighted in the following with particular reference to the attached figures in which:

- figure 1 shows a side view of two exemplars of the device for carrying out crease, object of the present invention, associated with a machine for working a cardboard sheet or similar, for instance for carrying out packages made of corrugated cardboard or similar;
- figure 2 shows a front, enlarged and partially sectioned view of the device of figure 1 in which some portions have been removed for better highlighting others;
- figure 3 shows a side, enlarged and partially sectioned view of the device of figure 1;
- figure 4 shows a frontal and enlarged view of the two disassembled disc like side means and a circular blade means, of a tool of the device of figure 1;

[0008] In figures 1-4 the numeral 1 indicates the device for carrying out creases object of the present invention

mounted in a sliding way onto a machine M for working a cardboard sheet or similar.

[0009] The device is fit for longitudinal assembly, as in figure 1 and/or transversal for carrying out respectively longitudinal and transversal creases.

[0010] The device 1 is provided with a tool 2 comprising two side discs 3, 4 and, interposed between them, a circular blade means 5 fixed protruding to the side disc means 3, 4 coaxially to them.

[0011] The peripheral edges of said side disc means 3, 4 and of the circular blade means are fit to act onto the sheet carrying out the crease easy foldable even if very long.

[0012] The circular blade means 5 is provided with peripheral teeth 6 fit to produce a discontinuous cut or a perforated line, onto the bottom of the crease carried out into the sheet. The peripheral portion of the circular blade means 5 is sharp, with the peripheral teeth 6 thickness progressively decreasing outward.

[0013] Said teeth have the shape of an annulus sector and they are angularly spaced in a regular manner. The angular distance between two teeth is equal or greater than the angle subtended by each tooth.

[0014] Each side disc means 3, 4 has a flat outer face 10 and an inner face 11 adjacent to the circular blade means 5 and having a diameter slightly bigger than the diameter of the outer face.

[0015] The annular surface of the peripheral edge 8, 9 of each side disc means 3, 4 is almost shaped like a torus annular sector. Particularly the annular surface portion of the peripheral edge 8, 9 adjacent to the inner face 11 is almost perpendicular to said inner face 11.

[0016] The side disc means 3, 4 and the circular blade means 5 are mutually clamped and fixed to a freely rotating shaft 24 of the tool 2 by clamping means 7, of the screw type or similar. The side disc means 3, 4, the circular blade means 5 and the idle shaft 24 are coaxial and rotate around their axis.

[0017] The two side disc means 3, 4 and the circular blade means 5 have respective housings 20, 21, 22, for instance made by respective pass-through holes, made at the same distance from respective centers and fit to house an anti-rotation means 23, for instance a sphere or a pin, for the synchronous rotation of the side disc means 3, 4 and of the circular blade means 5.

[0018] The device further comprises a matching means 30 opposite to the tool 2 in respect to the sheet. The matching means 30 has a groove 31 interposed between the two sides 32, 33 fit respectively to house the ends of the teeth 6 and the circular blade means 5 and fit to match with the sheet side portions adjacent to the crease. The matching means 30 has an almost cylindrical shape with groove 31 having circular shape and coplanar to the circular blade shape 5 and it is rotating around its own geometrical axis parallel to the shaft axis 24.

[0019] The cylindrical matching means is idle or, alternatively is driven in rotation, at a speed corresponding to the advancing velocity of the cardboard sheet, by motor

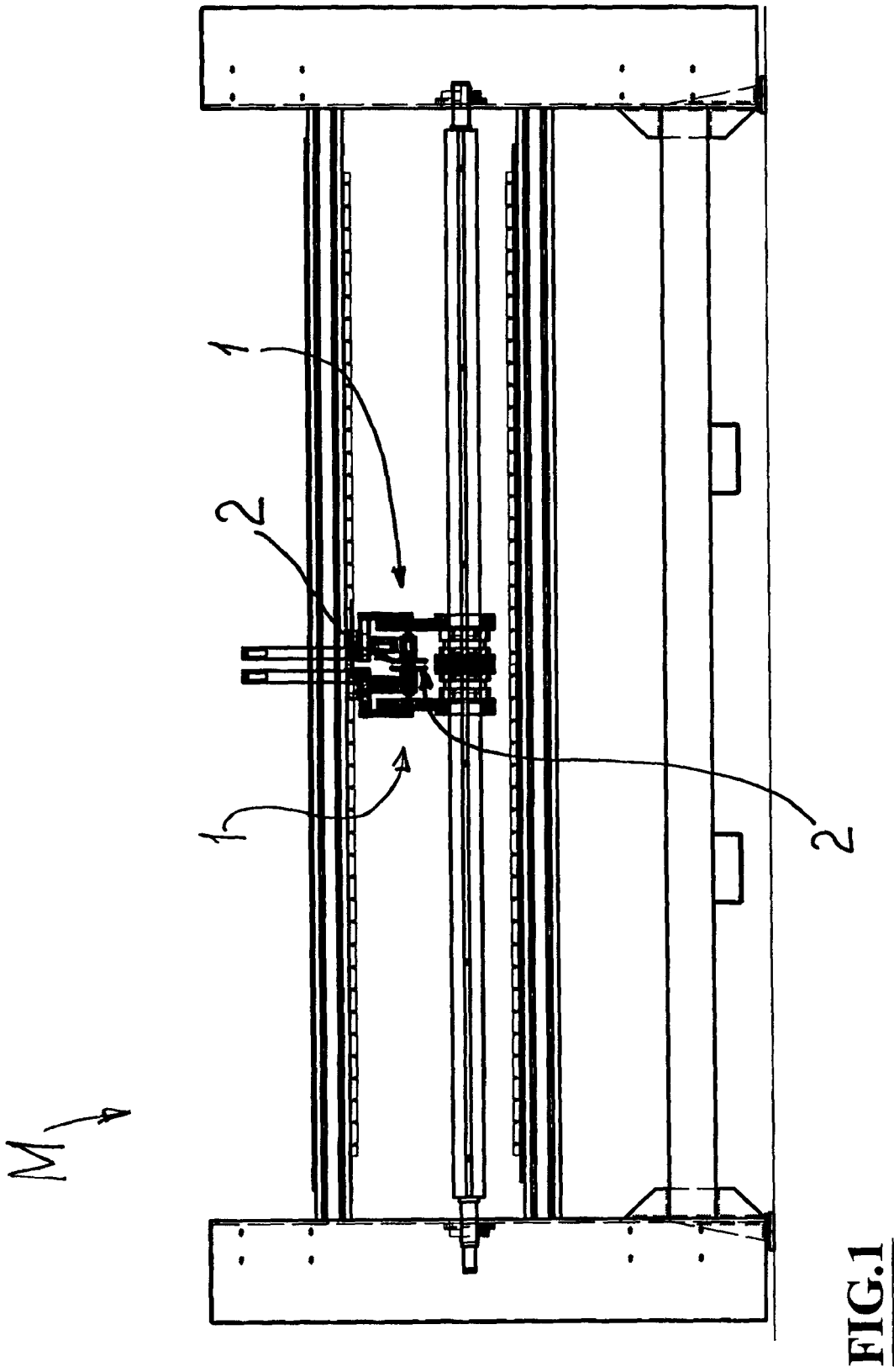
means to which it is connected through transmission means. The matching means 30 and the tool 2 are interconnected through adjusting means for the adjusting of their mutual distance and/or elastic approaching means.

[0020] The operation of the device provides that the sheet interposed between the tool 2 and the matching means 30, longitudinally or transversally oriented, and having longitudinal or transversal motion undergoes the side disc means action 3, 4 which compress it forming a longitudinal or transversal crease and the action of the circular blade means 5 which forms a discontinuous cutting line onto the bottom of said crease.

[0021] An advantage of the present invention is to provide a device for carrying out crease, even very long, which allows to fold comfortably the sheet onto which they have been carried out.

Claims

1. Device for carrying out creases fit for a machine (M) for working a cardboard sheet or similar and comprising a tool (2) having a disc shape; said device (1) being **characterized in that** the tool (2) comprises at least a side disc means (3, 4) and a circular blade means (5) fixed protruding to the at least said side disc means (3, 4); the peripheral edges of said at least side disc means (3, 4) and of a circular blade means (5) being fit to carry out a crease with cuts on the sheet matching by pressure a face thereof.
2. Device according to claim 1 **characterized in that** the tool (2) comprises a two side disc means (3, 4) and that the circular blade means (5) is fixed between them.
3. Device according to claim 1 or 2 **characterized in that** the circular blade means (5) is provided with peripheral teeth (6).
4. Device according to claim 3 **characterized in that** the peripheral portion of the circular blade means (5) is sharp, with the teeth thickness progressively decreasing outward.
5. Device according to claim 1 **characterized in that** the annular surface of the peripheral edge (8, 9) of each side disc means (3, 4) is almost shaped as a torus annular sector.
6. Device according to claim 1 **characterized in that** each side disc means (3, 4) has a flat outer face (10) and an inner face (11) adjacent to the circular blade means (5) and having a diameter slightly bigger than the diameter of the outer face; the annular surface portion of the peripheral edge (8, 9) adjacent to the inner face (11) being almost perpendicular to said inner face (11).
7. Device according to claim 2 **characterized in that** it comprises clamping means (7), of the screw type or similar, of the side disc means (3, 4) and of the circular blade means (5) for clamping to the tool (2).
8. Device according to claim 2 **characterized in that** the two side disc means (3, 4) and the circular blade means (5) have respective housings (20, 21, 22) made at the same distance from the respective centers and fit to house a anti-rotation means (23) for the synchronous rotation of the side disc means (3, 4) and of the circular blade means (5).
9. Device according to claim 7 and 8 **characterized in that** the clamping means (7) block the side disc means (3, 4) and the circular blade means (5) to a shaft (24) of the tool (2) freely rotating around their common geometrical axis.
10. Device according to any of the previous claims **characterized in that** it comprises a matching means (30) opposite to the tool (2) with respect to the sheet.
11. Device according to claim 10 **characterized in that** the matching means (30) has a groove (31) interposed between two sides (32, 33) fit to house respectively the teeth ends (6) the circular blade means (5) and to match with the sheet side portions and adjacent to the crease.
12. Device according to claim 11 **characterized in that** the matching means (30) has an almost cylindrical shape with groove (31) having a circular shape and coplanar to the circular blade means (5) and rotating around its own geometrical axis.
13. Device according to claim 12 **characterized in that** the cylindrical matching means (30) is idle or is driven for rotating by motor means which it is connected thereto through transmission means.
14. Device according to claim 10 **characterized in that** the matching means (30) and the tool (2) are interconnected through adjusting means for adjusting their mutual distance and/or elastic approaching means.



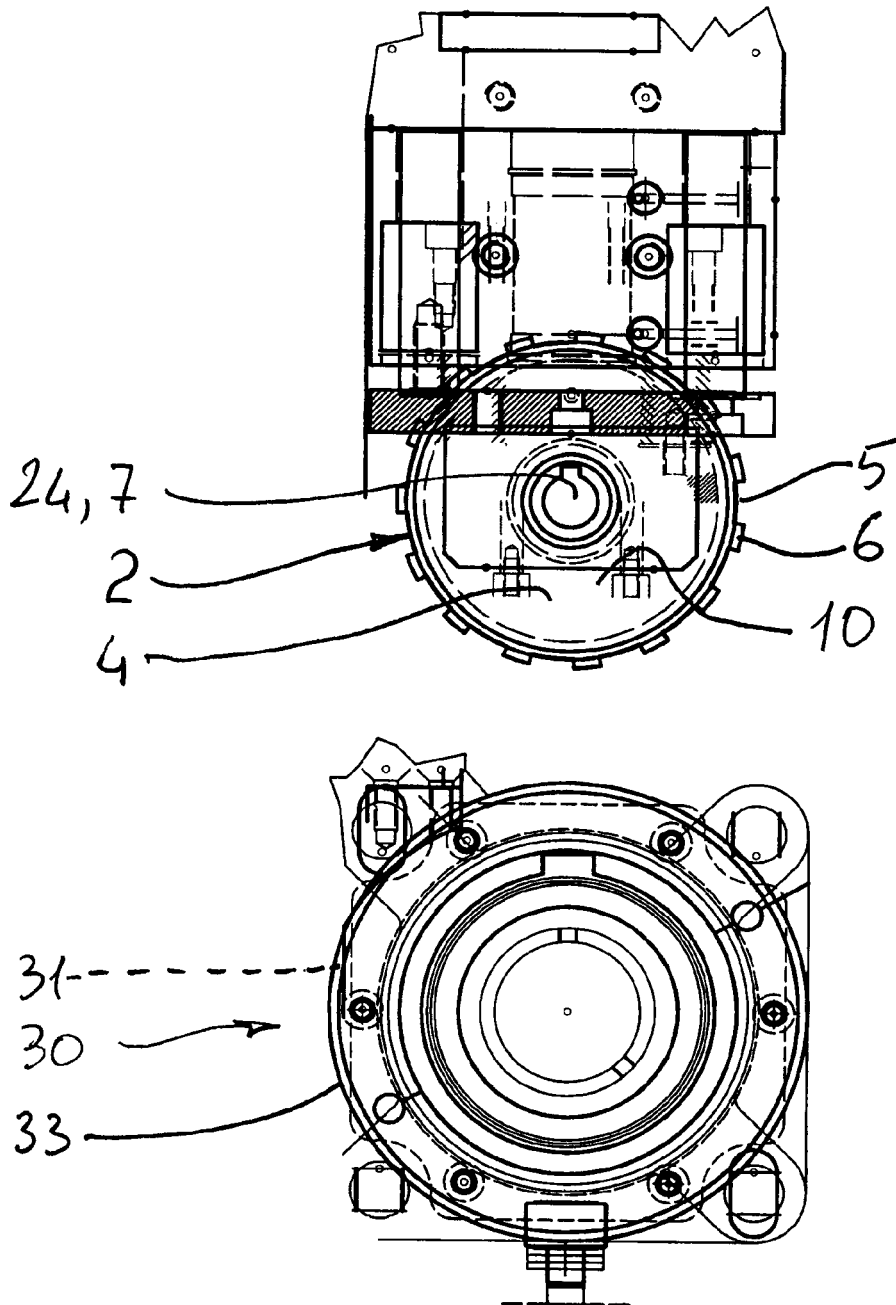
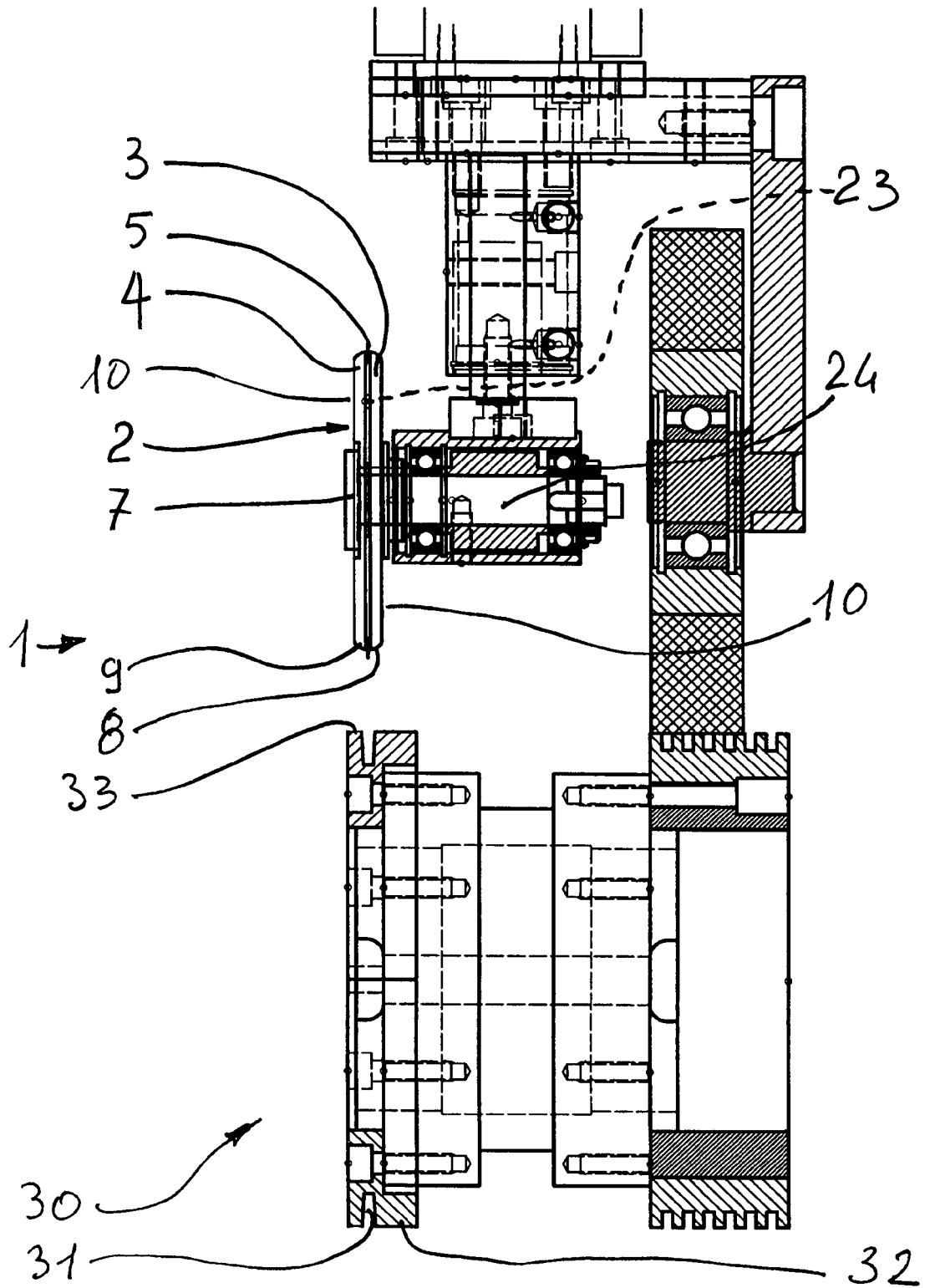


FIG.2

FIG.3



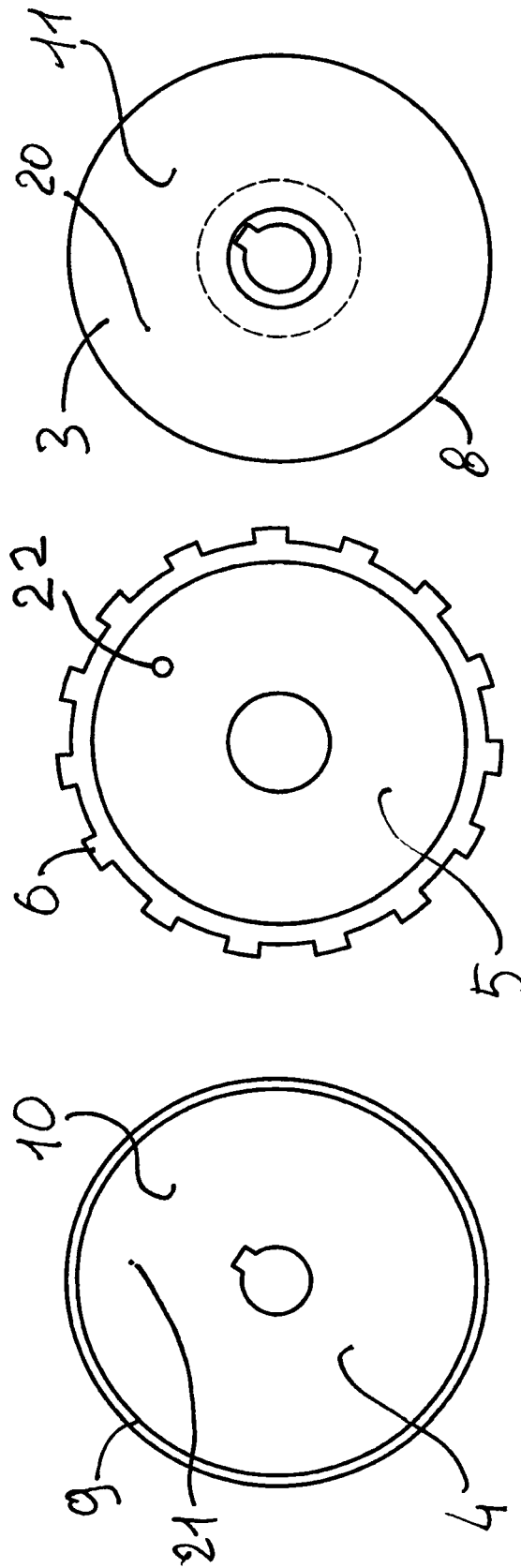


FIG.4