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(54) Apparatus for shaping angle section bars

(57) The invention concerns to an apparatus (1) for shaping angle section bars (14), comprising means (8, 9) for the introduction and guide of the section bar (14) to be shaped, motorization means (2) for advancing the section bar (14), means (26 - 45) for bend the section bar (14), and means (13) for varying the bending of the section bar (14).

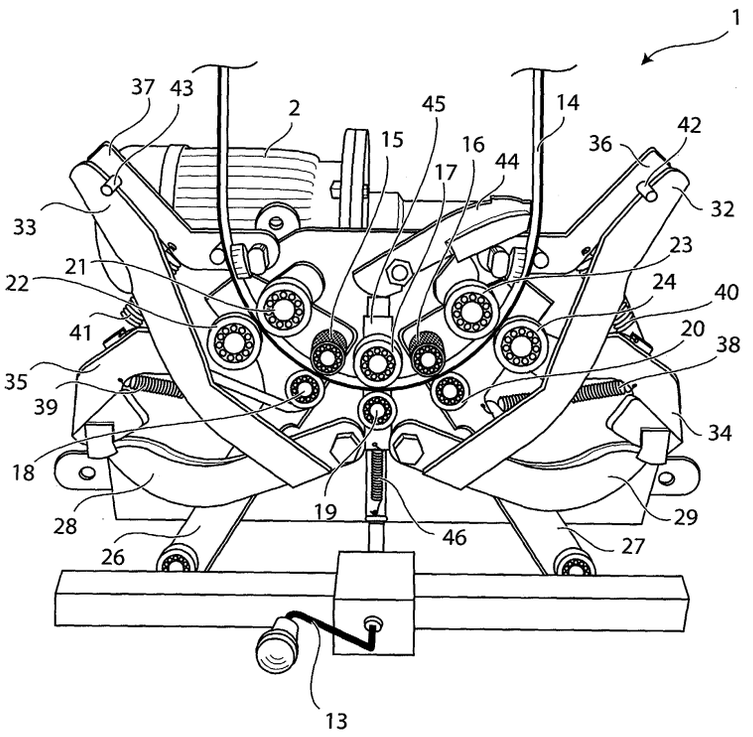

Fig. 7

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Description

[0001] The present invention relates to an apparatus for shaping angle section bars.

[0002] More specifically, the invention concerns an apparatus of the above kind allowing to automatically and very easily shape angle section bars having different thickness.

[0003] The solution suggested according to the present invention is particularly suitable for shaping edges for letters to be used when realising signs and like, having more or less large dimensions, being understood that the same apparatus can also be employed for shaping section bars for different uses.

[0004] During the years, it is remarkably increased the number of signs, having more or less large dimensions, mainly, but not exclusively, realised for advertising purposes.

[0005] Increasing demand has not been followed by a corresponding technological development for realising letters, or more general shaped form, necessary for realising writings.

[0006] In fact, as it is well known, advertising signs are mainly comprised of a transparent material surface, behind which, in many cases, the lighting source is provided, said surface being perimetrally blocked by an angle section bar, shaped in such a way to correspond to the profile of the transparent material.

[0007] If on one side shaping of the transparent material can be made rather easily, not so easy is the shaping of the section bar, particularly in case of complicated shapes, having large dimensions, and different thicknesses.

[0008] In fact, at present, shaping of angle section bars is carried out by mainly manual operations, requiring very long time to be completed, besides a remarkable manual capability by the worker, and in any case not comparable with the costs of the whole sign.

[0009] In this situation, the Applicant has realised an apparatus allowing to shape in a very easy and automatic way angle section bars, in such a way to be able to obtain very quickly and with reduced costs, every shape it is wished to realise.

[0010] Another object of the present invention is that of providing an apparatus allowing shaping angle section bars having different thickness.

[0011] It is therefore specific object of the present invention an apparatus for shaping angle section bars, comprising means for the introduction and guide of the section bar to be shaped, motorization means for advancing the section bar, means for bend the section bar, and means for varying the bending of the section bar.

[0012] Preferably, according to the invention, said means for the introduction and guide of the section bar to be shaped comprise a front element and a rear element, substantially parallel each other, said front and rear elements realising a section bar passage zone, and coupled in such a way to be separable and to make it possible to adjust their distance.

[0013] Furthermore, according to the invention, said section bar is guided, during its advancement, by pair of idle rolls.

[0014] Still according to the invention, said motorization means for advancing the section bar are coupled, by transmission means, to a pair of motorised rolls, being provided relevant idle rolls corresponding to each one of the motorised rolls.

[0015] Particularly, said transmission means can be comprised of an output shaft and of a gear system, transmitting the motion to both the motorised rolls.

[0016] Always according to the invention, said motorization means allow the advancement of the section bar according two opposite directions.

[0017] In a particularly preferred embodiment of the apparatus according to the invention, said section bar bending means comprise a pair of central idle rolls, provided between said dragging motorised rolls, one or more pairs of idle lateral rolls, for guiding the section bar during its advancement, and lever means, acting on said pairs of idle and motorised rolls, to modify their position each other, in such a way to create a different path for the section bar, with the consequent shaping of the same.

[0018] Preferably, according to the invention, said means for varying the bending of the section bar can vary the bending while the apparatus is operating, and the section bar is moving.

[0019] Still according to the invention, the means for operating the apparatus, to vary the direction of advancement of the section bar and to vary the bending of the section bar can be comprised of manual means, electronic means and/or automatic means.

[0020] The present invention will be now described, for illustrative but not limitative purposes, according to its preferred embodiments, with particular reference to the figures of the enclosed drawings, wherein:

figure 1 is a front view of an embodiment of the apparatus according to the invention;
figure 2 is a rear view of the apparatus of figure 1;
figure 3 is a first lateral view of the apparatus of figure 1;
figure 4 is a second lateral view of the apparatus of figure 1;
figure 5 shows a particular of the apparatus of figure 1;
figure 6 is a front view of the apparatus of figure 1, with the front cover removed, to better evidence some parts of the apparatus during a first shaping phase of a section bar; and
figure 7 is a view similar to the view of figure 6, in a second shaping phase of the section bar.

[0021] It is to be preliminarily noted that the figures of the enclosed drawings represent an prototypal embodiment realised by the inventor, but it is well evident that

an industrialisation of the inventive apparatus could bring to a realisation of different kind, always respecting the inventive principles introduced in this specification.

[0022] Making first reference to figures 1 - 5, it is shown an apparatus 1 according to the invention, for shaping angle sectin bars.

[0023] Said apparatus 1 has motor 2 transmitting the motion to the apparatus 1 by an output shaft 3, and a gear system 4, 5, 6, 7 (see figure 5), driving two dragging rolls (that will be described in greater detail in the following making reference to figure 6 and 7).

[0024] Still, said apparatus provides a rear wall 8 and a front wall 9, creating a guide for the section bar to be shaped, and that are maintained coupled by a screw 10, operated by a handle 11, to prevent the deformation of the section bar during the shaping operation.

[0025] At the front, apparatus 1 according to the invention provides an operation lever 12, also allowing reversing the advancement direction, as well as a lever 13 for varying the bending of the shaping. Both operation and variation of the bending could also be obtained by electronic control.

[0026] To better understand the operation of the apparatus 1 according to the invention, it is necessary to make specific reference to the enclosed figures 6 and 7, wherein the apparatus 1 is shown with the removal of the front wall 9, so that the section bar advancement and shaping mechanisms can be seen, the section bar being indicated in the figures by the reference number 14.

[0027] Mechanism provides two dragging rolls 15, 16, coupled to the two rear toothed wheels 6, 7, between which a guide idle roll 17 is provided.

[0028] Corresponding idle rolls 18, 19, 20 are provided opposed to the rolls 15, 16, 17, while other two pairs of guide idle rolls 21, 22 and 23, 24 are provided laterally.

[0029] Acting on the handle 13, provided on the lower part of the apparatus 1 according to the invention, determines the spreading apart of two rolls 24, 25 provided at the lower end with two levers 26, 27, and, widening, thrust upward two shaped levers 28, 29, further providing projections 28', 29', in order to prevent the disassembling.

[0030] Said levers 28, 29, are pivoted in the rotation points 30, 31 on the rear wall 8.

[0031] Opening of the levers 26, 27 determines the spreading apart of the rolls 18, 19 and 21, 22 and 23, 24 with respect to the mid line of the mechanism, with consequent bending of the path that must be followed by the section bar 14, as evidenced in an exaggerated way in figure 7. A symmetrical leverage system, respectively 32, 33; 34, 35; 36, 37, and buckling springs 38, 39; 40, 41 allows to maintain the symmetry of the curve given to the section bar 14.

[0032] As it can be noted in the figures 6 and 7, a projection 42, 43 is provided on the levers 36, 37, preventing to the lever 32, 33 to escape upward.

[0033] The sole guide roll pair not included within the symmetrical configuration is that of the central rolls 17, 20, on which the rocking lever 44 and the lever 45 act, and that, with the prosecution of the bending, is thrusted upward by the lever 36, and consequently thrusting downward said rolls 17, 20. Spring 46 opposes the movement of rocking lever 44 and of the lever 45.

[0034] It is well evident that the apparatus 1 according to the invention allows to shape the section bar 14, possibly with repeated runs, to obtain the wished shape. It also evident that varying the shaping while advancing the section bar 14, a complex shape can be obtained.

[0035] The present invention has been described for illustrative but not limitative purposes, according to its preferred embodiments, but it is to be understood that modifications and/or changes can be introduced by those skilled in the art without departing from the relevant scope as defined in the enclosed claims.

Claims

1. Apparatus for shaping angle section bars, **characterised in that** it comprises means for the introduction and guide of the section bar to be shaped, motorization means for advancing the section bar, means for bend the section bar, and means for varying the bending of the section bar.

2. Apparatus according to claim 1, **characterised in that** said means for the introduction and guide of the section bar to be shaped comprise a front element and a rear element, substantially parallel each other, said front and rear elements realising a section bar passage zone, and coupled in such a way to be separable and to make it possible to adjust their distance.

3. Apparatus according to claim 1 or 2, **characterised in that** said section bar is guided, during its advancement, by pair of idle rolls.

4. Apparatus according to one of the preceding claims, **characterised in that** said motorization means for advancing the section bar are coupled, by transmission means, to a pair of motorised rolls, being provided relevant idle rolls corresponding to each one of the motorised rolls.

5. Apparatus according to claim 4, **characterised in that** said transmission means are comprised of an output shaft and of a gear system, transmitting the motion to both the motorised rolls.

6. Apparatus according to one of the preceding claims, **characterised in that** said motorization means allow the advancement of the section bar according two opposite directions.

7. Apparatus according to one of the preceding claims, **characterised in that** said section bar bending means comprise a pair of central idle rolls, provided between said dragging motorised rolls, one or more pairs of idle lateral rolls, for guiding the section bar during its advancement, and lever means, acting on said pairs of idle and motorised rolls, to modify their position each other, in such a way to create a different path for the section bar, with the consequent shaping of the same.

8. Apparatus according to one of the preceding claims, **characterised in that** said means for varying the bending of the section bar vary the bending while the apparatus is operating, and the section bar is moving.

9. Apparatus according to one of the preceding claims, **characterised in that** the means for operating the apparatus, to vary the direction of advancement of the section bar and to vary the bending of the section bar can be comprised of manual means, electronic means and/or automatic means.

10. Apparatus for shaping angle section bars according to each one of the preceding claims, substantially as illustrated and described.

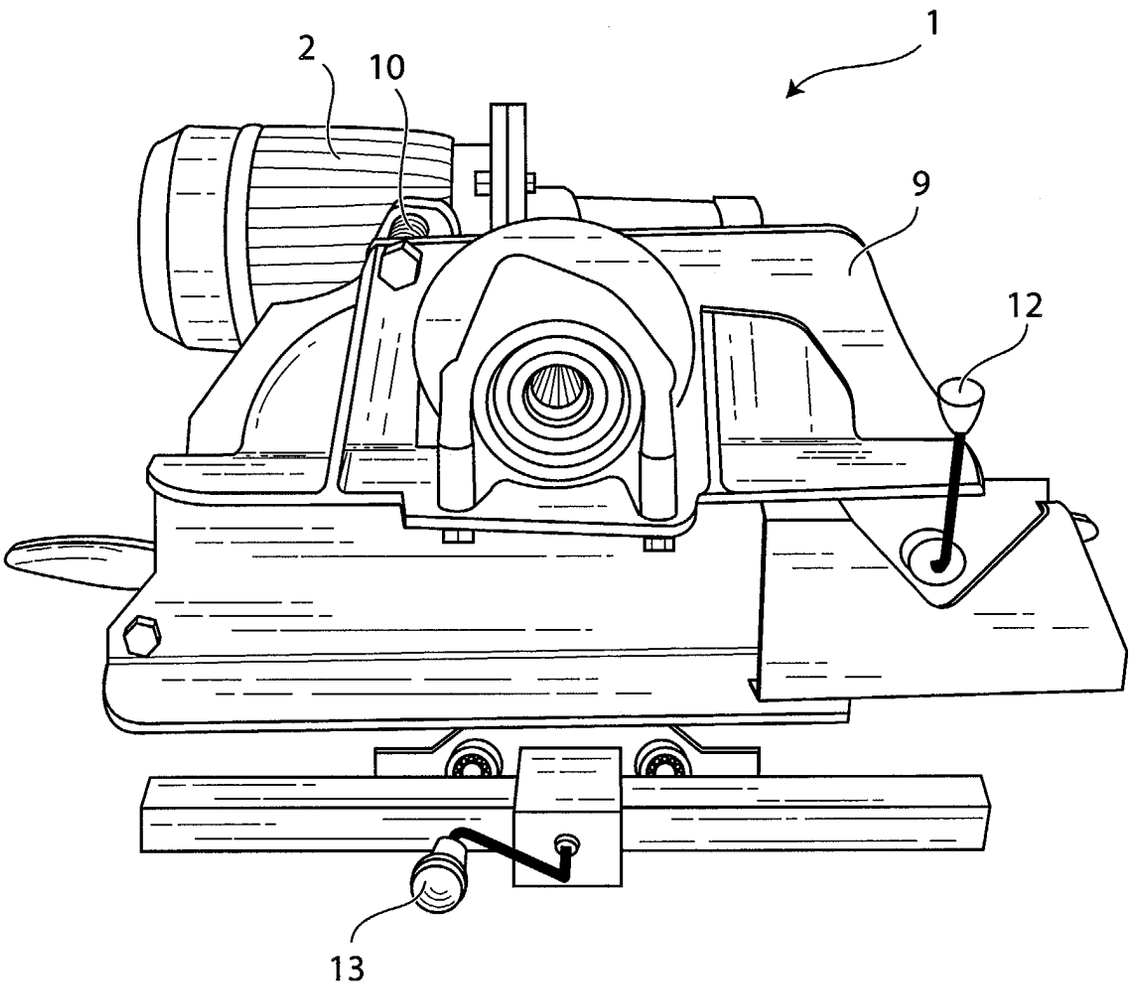

FIG. 1

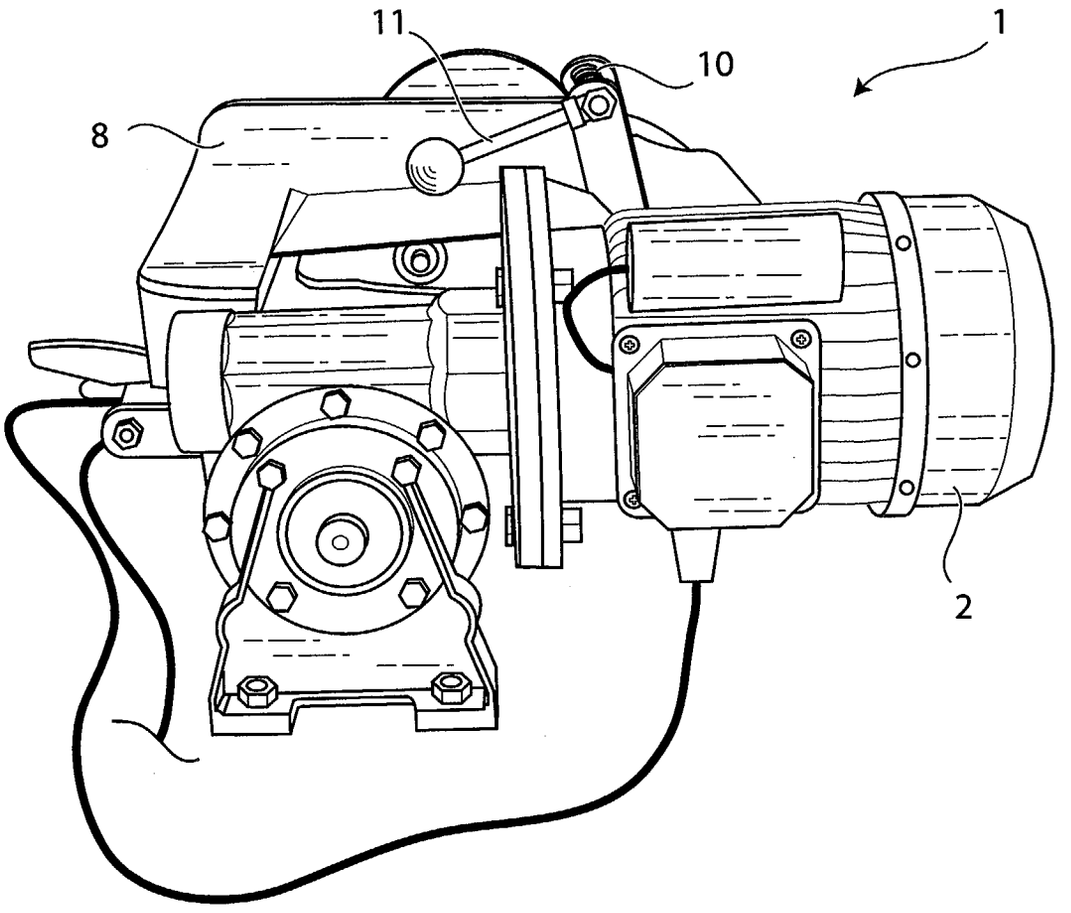

FIG. 2

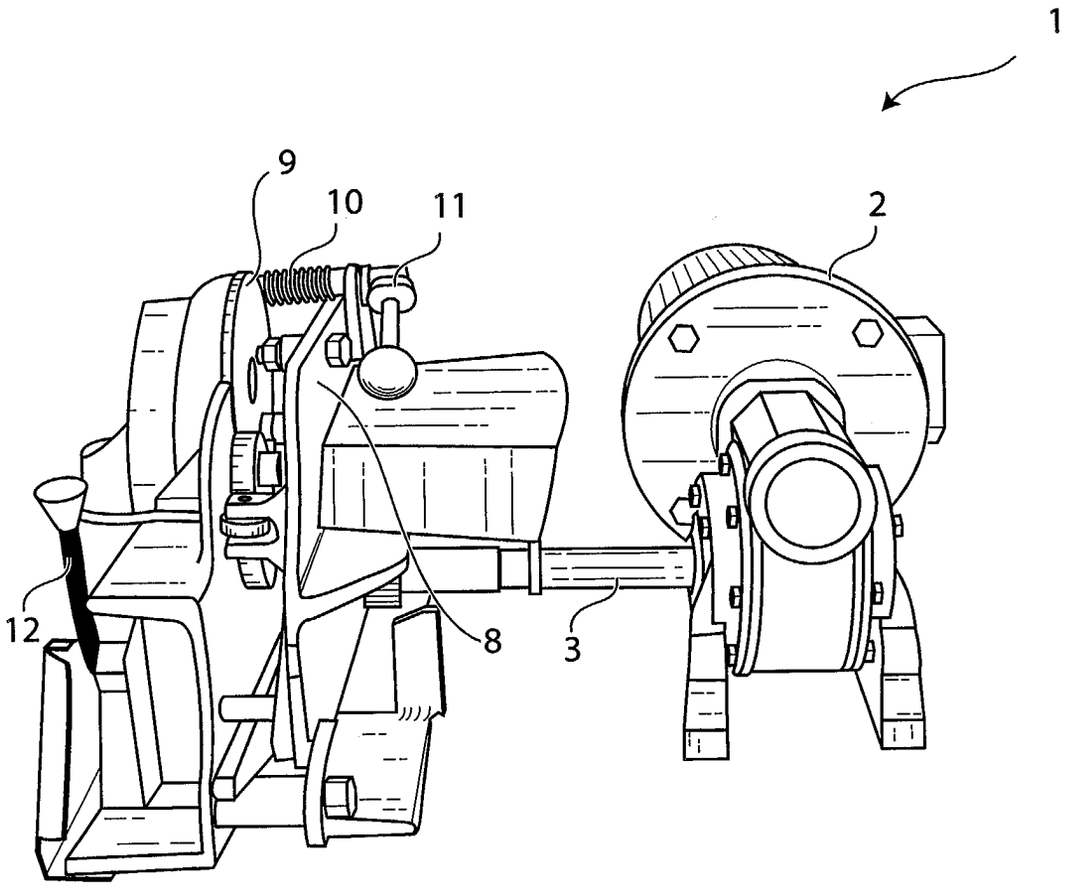

FIG.3

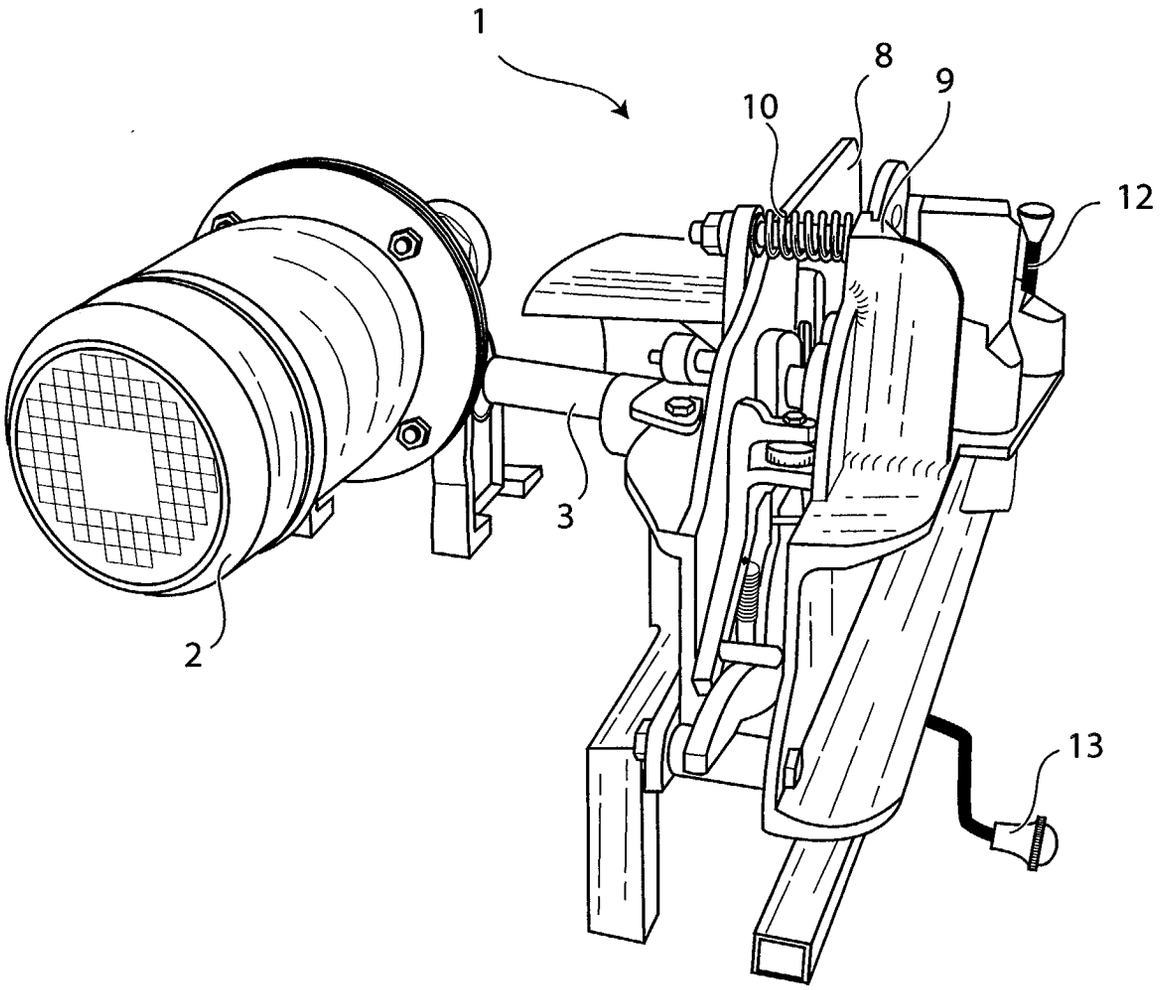

FIG. 4

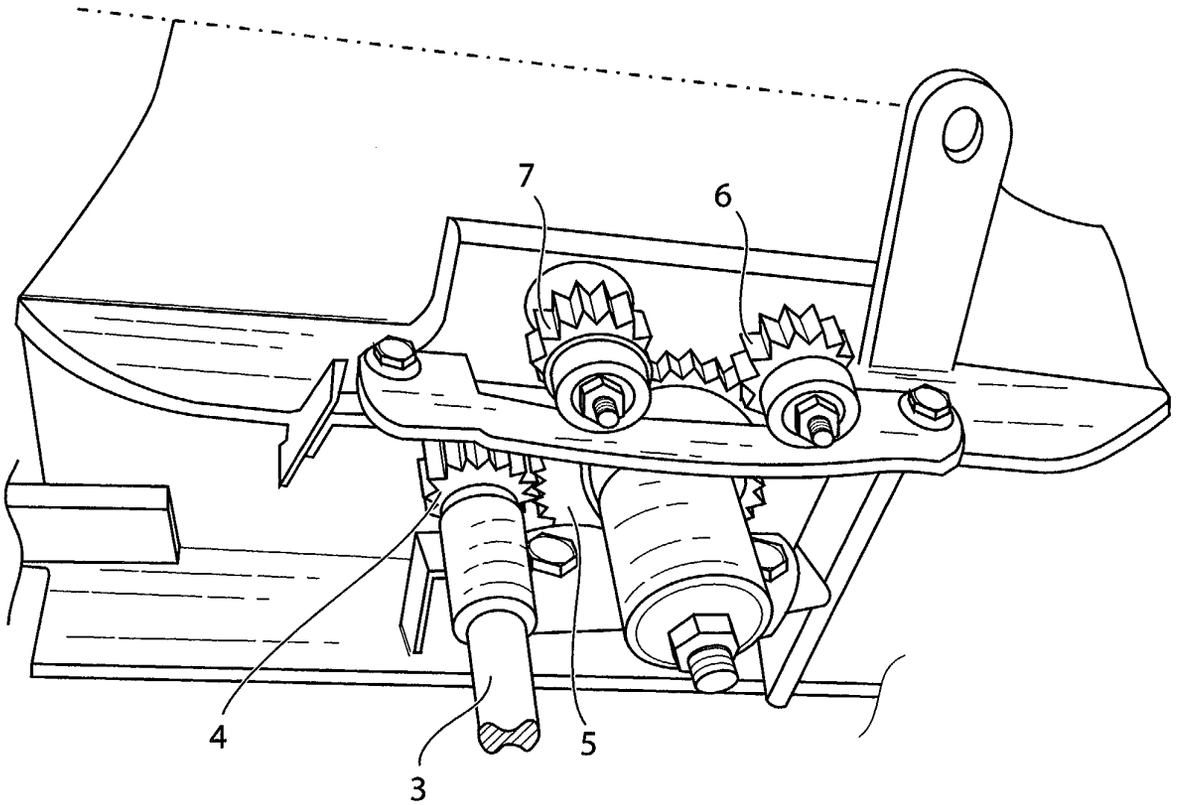

FIG. 5

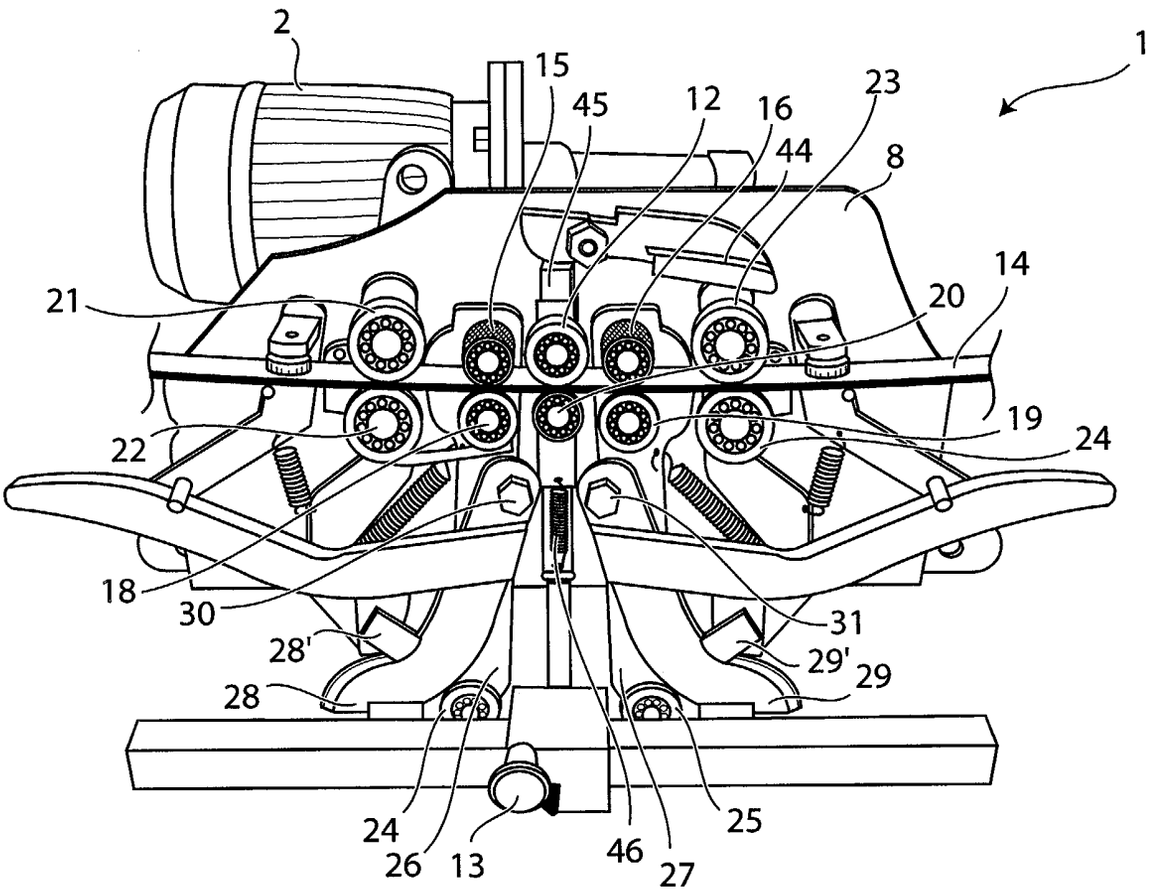
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FIG. 6

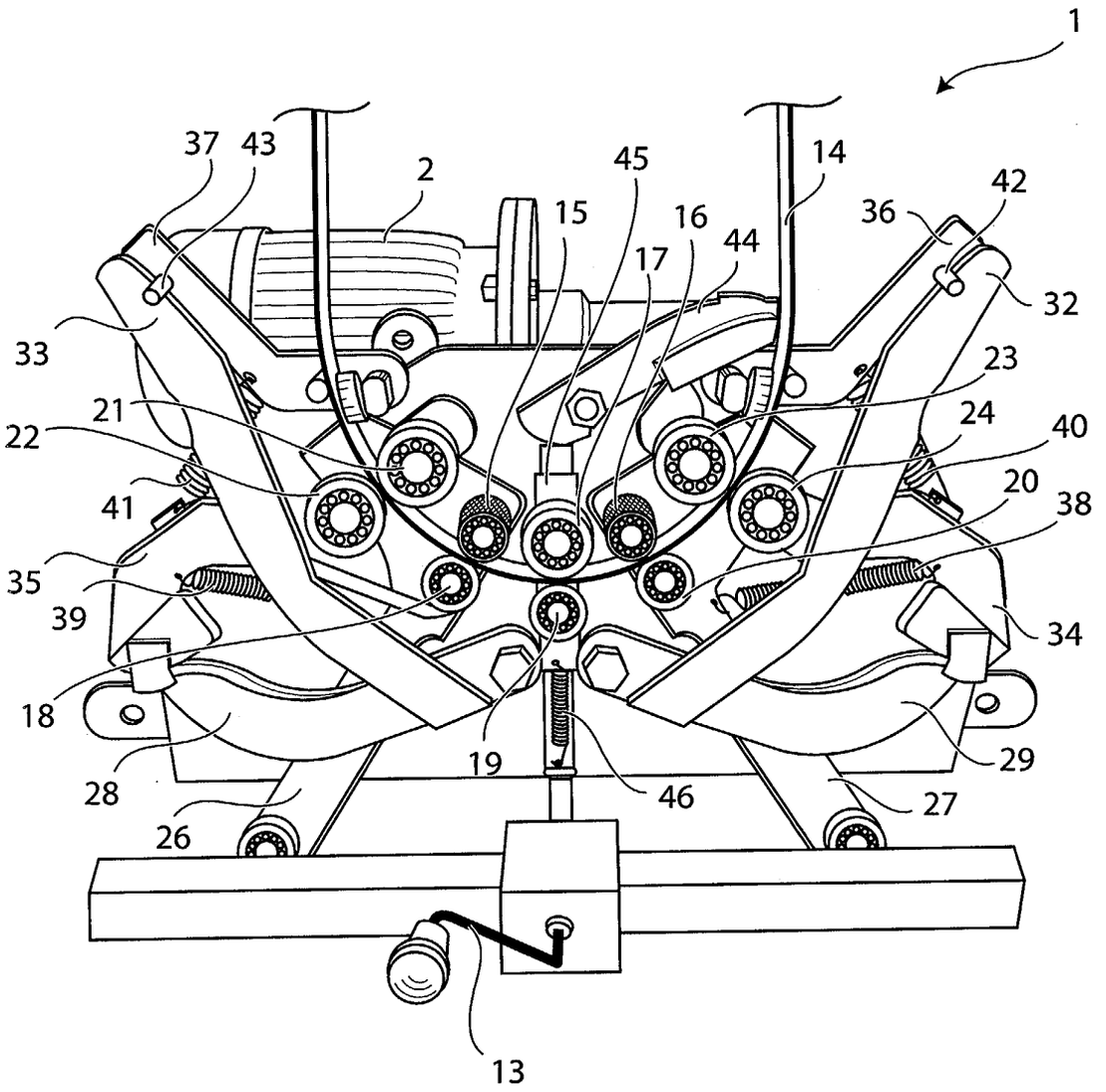
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Fig. 7