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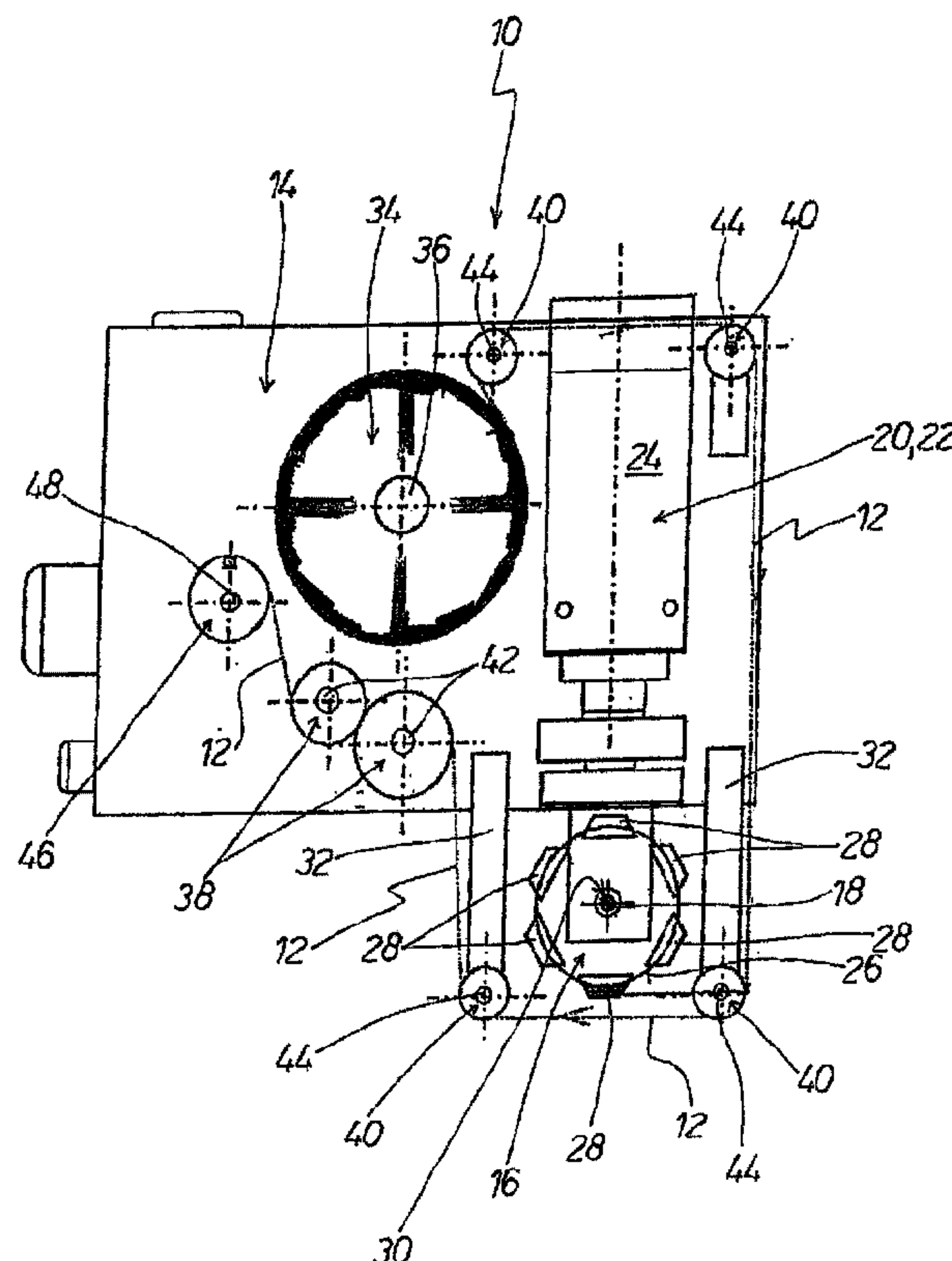
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(54) Titre : APPAREIL DE GAUFRAGE

(54) Title: EMBOSsing APPARATUS



(57) Abrégé/Abstract:

There is described an apparatus for embossing a decorative layer of an embossing film (12) which is of a strip form, on to a small-radiused corner of a surface element, wherein a high cycle speed and high cycle rates are achieved in that the embossing apparatus (10) has a revolver head (16) which is rotatable stepwise about an axis (18) and which at its periphery (26) has a number of elastic pressing members (28) with which a heating device (30) is associated, wherein the revolver head (16) is reciprocally movable on a linear drive device (20) between an embossing position and an inactive position.

Abstract

There is described an apparatus for embossing a decorative layer of an embossing film (12) which is of a strip form, on to a small-radiused corner of a surface element, wherein a high cycle speed and high cycle rates are achieved in that the embossing apparatus (10) has a revolver head (16) which is rotatable stepwise about an axis (18) and which at its periphery (26) has a number of elastic pressing members (28) with which a heating device (30) is associated, wherein the revolver head (16) is reciprocatingly movable on a linear drive device (20) between an embossing position and an inactive position.

(Figure)

Embossing apparatus

Technical Field

5 The invention concerns an apparatus for embossing a decorative layer of an embossing film which is of a strip form, on to a small-radiused corner of a surface element.

Background

10 An apparatus for embossing a decorative layer of an embossing film which is of a strip form on to the narrow sides, which delimit a surface element, of the surface element is known for example from DE 102 16 139 C1. With that known embossing apparatus it is possible for surface elements to be embossed at their narrow sides with the decorative layer of an embossing film which is of a strip form,
15 at high cycle speeds, that is to say high cycle rates. If however the respective surface element has rounded configurations of a small radius at its corners, then the corresponding decorative layer portions at those corners have hitherto been fixed to the rounded corners for example by means of a tool which is to be operated manually. That manual mode of operation is however only possible at low cycle
20 speeds or cycle rates so that the productivity correspondingly leaves something to be desired. The rounded configurations can for example involve a radius of between 2 mm and 5 mm, in which respect it will be appreciated that the corresponding problems also arise in relation to radii of different sizes.

25 For embossing rounded corners of surface elements, it is for example also possible to use a stroke embossing procedure as can be carried out for example with an embossing machine of the PE500/KTF 'Touchwood' type. However corners of a surface element, which involve a small radius, can only be embossed at moderate cycle speeds, when using an embossing machine of that kind.

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Likewise it is possible for pin elements comprising a plastic material to be rolled in peripheral relationship against the surface element to be embossed, in

which case the surface element to be embossed and the pin elements perform a relative movement with respect to each other during the decoration procedure. Higher embossing speeds can admittedly be achieved, in comparison with a stroke embossing procedure, when using such a known double embossing head; however, 5 that higher speed still leaves something to be desired in comparison with an embossing apparatus in accordance with above-mentioned DE 102 16 139 C1, for embossing narrow sides of surface elements. That results for example from the insulating properties of the plastic pins of the double embossing head as the heat has to be transported from the interior of the punch or pressing member to the 10 surface thereof, which requires a relatively large amount of time. The through-put of surface elements to be embossed, per unit of time, is correspondingly low.

Summary of the Invention

15 In consideration of those factors the object of the invention is to provide an embossing apparatus of the kind set forth in the opening part of this specification, with which it is possible, at a high level of productivity, that is to say with a high embossing speed and with high cycle rates, to emboss small-radiused corners of a surface element with a decorative layer of an embossing film in strip form.

20 In an apparatus of the kind set forth in the opening part of this specification, in accordance with the invention that object is attained by a revolver head which is rotatable stepwise about an axis and which is provided at a linear drive device reciprocatingly movable between an embossing position and an inactive position 25 and which at its periphery has a number of elastic pressing members, wherein a heating device for the pressing members is associated with the revolver head.

The configuration of the embossing apparatus according to the invention provides for a rapid supply of heat to the elastic pressing members. A freshly 30 heated elastic pressing member is in a condition of embossing operation at any time so that a correspondingly high cycle speed is achieved. The term 'elastic' is used to denote a pressing member when the surface of the material from which the

pressing member is formed is of a hardness in the range of between 45° Shore and 95° Shore, preferably in the range of between 60° Shore and 80° Shore, in particular about 70° Shore.

5 In that respect the elasticity of the surface of a pressing member is to be matched to the radius of the corner of the surface element, which is to be embossed upon. Thus at the periphery of the revolver head, the elastic pressing members are to be pressed against the surface element in the region of the radius of the corner thereof, in such a way that each pressing member adapts to the radius
10 and thus leads to optimum transfer of the decorative layer on to the corner of the surface element. The smaller the radius is, the correspondingly more elastic is a pressing member accordingly to be.

In the case of the embossing apparatus according to the invention the linear
15 drive device can be formed by a piston-cylinder device.

The pressing members can have at least at their surface silicone rubber, it may be desirable if the pressing members comprise silicone rubber.

20 The heating device for the elastic pressing members provided on the revolver head is preferably provided at the center of the revolver head. For that purpose the heating device is preferably provided at the axis of the revolver head. Likewise it is possible for the heating device to have heat radiating devices, between which the revolver head is disposed, wherein the heat radiating devices are preferably
25 arranged in a plane oriented perpendicularly relative to the axis of the revolver head.

The revolver head with the associated linear drive device and the heating device are desirably provided on a main frame structure on which an embossing
30 film supply roll, the film advance and direction-changing rollers and the take-up roll are mounted at associated mounting shafts. The mounting shafts for the embossing film supply roll, the film advance and direction-changing rollers and the take-up roll

are preferably oriented in parallel relationship with the axis of the revolver head.

Optimum use of the apparatus according to the invention can be effected in that there are provided a number of main frame structures, that corresponds to the number of rounded corners of the respective surface element, wherein the revolver heads are reciprocatingly movable simultaneously between the embossing position and the inactive position.

It is highly productively possible with the embossing apparatus according to the invention to emboss the rounded corners of a surface element, which involve a small radius of for example between 2 and 5 mm, with an embossing film in strip form, wherein the corresponding cycle speeds are adapted to the cycle speeds of the embossing apparatus at which the narrow sides of the surface element are embossed with the 5 embossing film in strip form. Those narrow surfaces can in that respect be of a straight or curved, wavy or any other configuration. The corners of the respective surface element, which are of a small radius, like its narrow sides, can be of a configuration involving a flat surface or a concavely or convexly curved shape.

Further details, features and advantages will be apparent from the description hereinafter of an embodiment by way of example of the embossing apparatus according to the invention.

Brief Description of the Drawing

Figure 1 is a side view of an embossing apparatus according to an example.

Detailed Description

Figure 1 shows an embodiment of the embossing apparatus 10 which is provided for embossing a decorative layer of an embossing film 12 which is in the form of a strip, on to a small-radiused corner of a surface element (not shown). The

embossing apparatus 10 has a main frame structure 14, on which a revolver head 16 is rotatable stepwise about an axis 18. The revolver head 16 is provided at a linear drive device 20. The linear drive device 20 is formed by a piston-cylinder device 22. The cylinder 24 of the piston-cylinder device 22 is fixed to the main frame structure 14. The revolver head 16 is connected to the piston of the piston-cylinder device 22.

The revolver head 16 is reciprocatingly movable between an embossing position and an inactive position by means of the linear drive device 22.

At its periphery 26 the revolver head 16 has a number of elastic punch or pressing members 28. The pressing members 28 comprise silicone rubber and are arranged uniformly spaced at the periphery 26 of the revolver head 16.

A heating device 30 for the pressing members 28 is associated with the revolver head 16. The heating device 30 is preferably provided in the center of the revolver head 16. It is particularly advantageous in that respect if the heating device 30 is provided in the axis 18 of the revolver head.

Reference 32 in Figure 1 denotes film direction-changing roller loops.

An embossing film supply roll 34 is mounted rotatably on a mounting shaft 36 on the main frame structure 14 of the embossing apparatus. Film advance rollers 38 and direction-changing rollers 40 are also rotatably mounted on the main frame structure 14 at associated mounting shafts 42, 44. A take-up roll 46 for the carrier strip of the embossing film 12 is also rotatably mounted on the main frame structure 14 at an associated mounting shaft 48.

CLAIMS

1. Apparatus for embossing a decorative layer of an embossing film (12) which is of a strip form, on to a small-radiused corner of a surface element, characterised by

a revolver head (16) which is rotatable stepwise about an axis (18) and which is provided at a linear drive device (20) reciprocatingly movable between an embossing position and an inactive position and which at its periphery (26) has a number of elastic pressing members (28), wherein a heating device (30) for the pressing members (28) is associated with the pressing members (28) of the revolver head (16), said pressing members being adapted to be pressed against the surface element in the region of the radius of the corner thereof whereby said pressing member adapts to the radius, and wherein said pressing member comprises a material having a hardness in the range between 45 and 95 degrees Shore, and wherein said revolver head is rotatable in a stepwise manner such that each pressing member is preheated by said heating device and subsequently provided for pressing the embossing film against the surface element.

2. Apparatus as set forth in claim 1 characterised in that the linear drive device (20) is formed by a piston-cylinder device (22).

3. Apparatus as set forth in claim 1 characterised in that the pressing members (28) have silicone rubber at least at the surface.

4. Apparatus as set forth in claim 1 characterised in that the pressing members (28) comprise silicone rubber.

5. Apparatus as set forth in claim 1 characterised in that the heating device (30) is provided at the center of the revolver head (16).

6. Apparatus as set forth in claim 5 characterised in that the heating device (30) is provided in the axis (18) of the revolver head (16).

7. Apparatus as set forth in claim 1 characterised in that the heating device (30) has heating radiating devices between which the revolver head (16) is provided.

8. Apparatus as set forth in one of claims 1 through 7 characterised in that the revolver head (16) with the associated linear drive device (20) and the heating device (30) are provided on a main frame structure (14) on which an embossing film supply roll (34), film advance and directionchanging rollers (38, 40) and a take-up roll (46) are mounted at associated mounting shafts (36, 42, 44, 48).

9. Apparatus as set forth in claim 8 characterised in that the mounting shafts (36, 42, 44, 48) for the embossing film supply roll (34), the film advance and direction-changing rollers (38, 40) and the take-up roll (46) are oriented parallel in relation to the axis (18) of the revolver head (16).

10. Apparatus as set forth in claim 8 characterised in that there are provided a number of main frame structures (14), that corresponds to the number of corners of the respective surface element to be embossed upon, wherein the revolver heads (16) are reciprocatingly movable simultaneously between the embossing position and the inactive position.

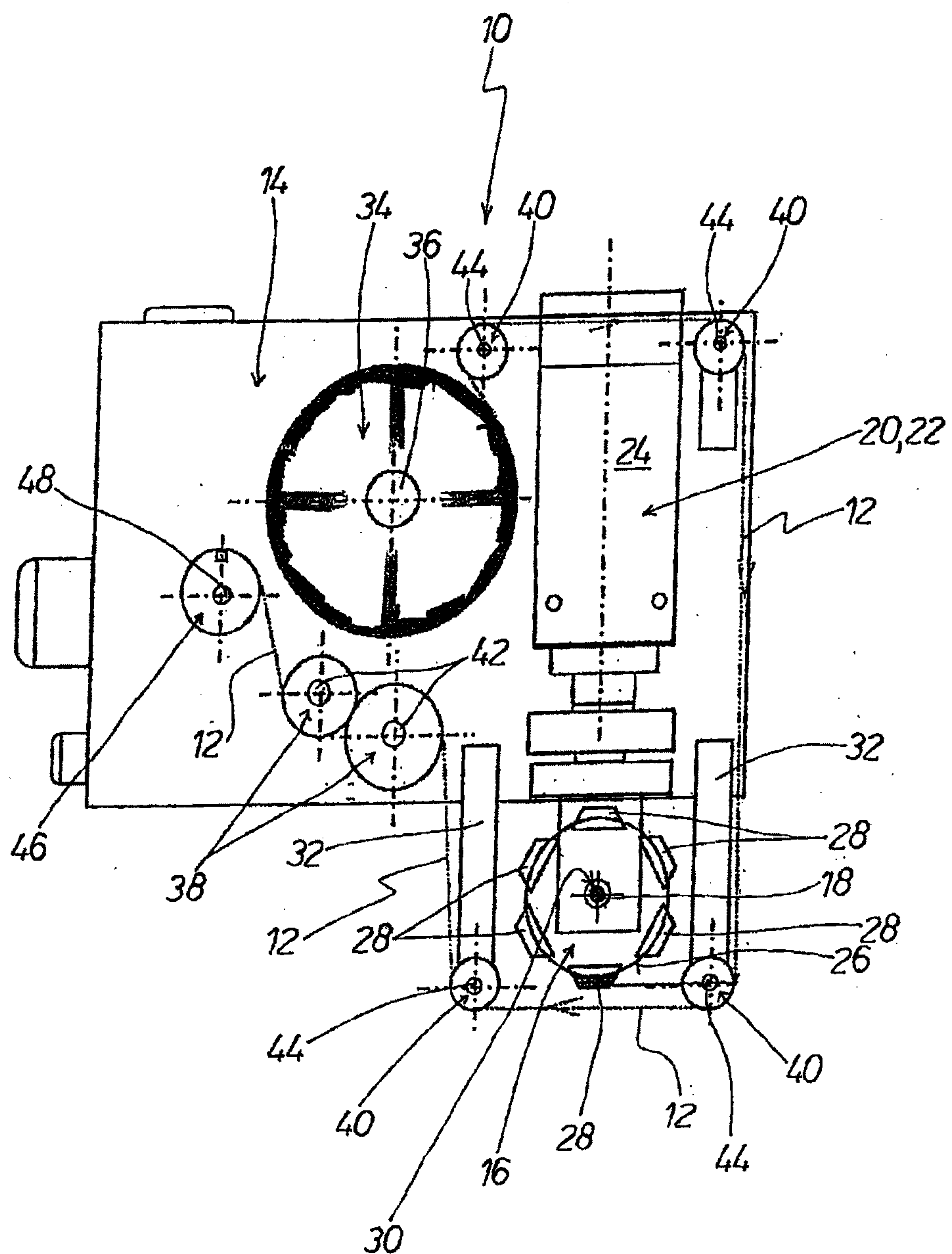


FIGURE 1

