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(54) **DRAWING ASSEMBLY IN MACHINES FOR WORKING METAL SECTIONS**

ZIEHANORDNUNG IN MASCHINEN ZUM BEARBEITEN VON METALLPROFILEN

MECANISME D'ETIRAGE DESTINE AUX MACHINES POUR TRAVAILLER DES SECTIONS DE METAL

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Description

Technical Field

[0001] The present invention relates to a drawing assembly intended for being applied in machines for working metal sections, in particular iron rods for reinforced concrete, according to the preamble of claim 1.

Background Art

[0002] It is known that the shaped rods used for example to produce frames for reinforced concrete are generally obtained from metal sections constituted by iron rods, in coils or bars. To this aim metal sections are supplied, one by one or in groups, to manufacturing machines which automatically perform the mass-working of the desired products.

[0003] More particularly, different cutting and bending machines are currently known, which are able to realize finished products, such as bars, stirrups and shaped pieces, from metal sections, in bars or coils. These manufacturing machines generally provide for a drawing assembly positioned along a suitable feeding line, a cutting assembly for the sections in order to have irons cut to size, and if necessary one or more bending assemblies to have irons bent according to the specific requirements. Moreover straightening members of any type (for example of roller, rotor or hyperbolic type) can be positioned along the feeding line. The sections are inserted in the insertion zone of the working line according to a predetermined progress direction. In particular the straightening operation is often performed by means of different sets of straightening members, which sometimes, as in the case of the straightening rollers, act on differentiated planes, for example on two orthogonal planes, substantially horizontal and vertical, in order to correct corresponding bending components. Suitably, for reasons of space claiming, the horizontal straightening members, in which the cited counter-rotating rollers are positioned on a substantially horizontal plane, are positioned upstream of the drawing assembly, while the vertical straightening members, in which the cited counter-rotating rollers are positioned on a substantially vertical plane, are positioned downstream of this drawing assembly.

[0004] The drawing assembly is in its turn generally constituted by couples of counter-rotating superimposed wheels or idle wheels. In general the drawing strain depends on different parameters, at the same conditions of which it surely increases by the diameter increase. The contact surface between the sections in progress and each couple of drawing wheels is limited, so that the specific pressure turns out to be very high and by diameter increase the strength limits of the material itself are exceeded, causing thus considerable damages. As building materials are concerned, which for reasons of rules and safety have to result intact, this problem is of primary importance. Moreover for different reasons, a consequent disadvantage is constituted by the possible rotation of the sections around their longitudinal axis, thus negatively affecting the quality of the bent pieces which are obtained, and causing a possible lack of planarity of the finished products, for example stirrups or shaped products, which may not lie on one plane.

[0005] The Italian patent No. 1038796 (corresponding to GB 1454738), in the name of the company EVG Entwicklungs U. Verwertungs Gesellschaft m.b.H., describes a drawing assembly constituted by at least three misaligned rollers which determine a curved progress pathway. More precisely, two of these rollers, one of which at least is motorized on a fixed axis, are positioned on a side of the said progress pathway, while the third roller, positioned on the other side of the progress pathway, has a floating axis and is elastically pushed by suitable pushing members. According to a particular embodiment, three rollers having fixed axes are positioned on a side of the progress pathway, and on the other side two rollers are fitted floating, so as to determine the said curved progress pathway. The two floating rollers are fitted vertically and coaxial to two corresponding rollers with fixed axis, having a diameter smaller than that of the other rollers, while the third roller with fixed axis is placed in a median position between the two previous couples of rollers.

[0006] A curved progress pathway for curved-type sections increases the amplitude of the contact surface between the sections in progress and the wheels of the drawing assembly, because it determines a partial winding of the sections on the wheels themselves, respectively along an arc of the curved pathway, with a beneficial effect on the specific pressure thus reduced and on the adhesion in the contact between the wheels and the sections.

[0007] A further disadvantage lamented in the machines intended for working more than one wire is constituted by the fact that the drawing assembly, in particular if provided with a curved type progress pathway for the sections, may produce a push on the rods engaging the last wheel of the preceding horizontal straightening assembly, thus causing the positioning of the same rods outside the provided groove and in a different way for each of them. This can obviously cause serious irregularity of the straightening.

Disclosure of the invention

[0008] The aim of the present invention is to solve the cited problems, by devising a drawing assembly in machines for working metal sections, which is able to improve in a significant way the adhesion of the drawing wheels and to improve the grip on the sections to be fed without being affected by the difference of the fed diameters and without causing disadvantages in case more wires are worked contemporarily.

[0009] Within this aim, a further scope of the present invention is to provide for a drawing assembly that is able

to reduce the specific pressure exerted on the metal sections in differentiated way, depending on the diameter of the worked rod, so as to avoid possible damages of the sections.

[0010] A further aim of the present invention is to provide for a drawing assembly with a structure that is simple, safely reliable in operation and highly flexible in use.

[0011] The cited aims are achieved, according to the invention, by the drawing assembly in machines for working metal sections, according to claim 1.

Brief Description of Drawings

[0012] Description details of the invention shall be further evident in the illustrations of preferred embodiments of the drawing assembly in machines for working metal sections, in the guideline drawings attached and wherein:

fig. 1 illustrates an overall frontal view of the drawing assembly according to the invention, in operational position;
fig. 2 illustrates the same frontal view of the drawing assembly, in opening position for the insertion of the sections to be fed;
fig. 3 illustrates a detailed view of a portion of the drawing assembly; figures 4 and 5 respectively illustrate an overall frontal view of different embodiments of the drawing assembly according to the invention, in operational position;
figures 6, 7 and 8 illustrate different views of a detail of the drawing assembly.

Best Mode for Carrying out the Invention

[0013] With reference to such figures, 1 refers to the drawing assembly intended to be applied in machines for working metal sections.

[0014] The drawing assembly 1 is positioned in known way downstream of straightening members and preferably in intermediate position between a first assembly of straightening members, lying on a substantially horizontal plane, and a second assembly of straightening members, lying on a substantially vertical plane, not shown in the figures attached. So in the illustrated case a drawing assembly that is downstream of the horizontal straightening assembly and upstream of the vertical straightening assembly is considered, as it often occurs. Obviously the use of any different positioning is not excluded.

[0015] The drawing assembly 1 comprises a set of drawing wheels suitably motorized and a set of contrasting wheels, substantially positioned on a same vertical plane, fit to determine between them a curved progress pathway P for the metal sections to be fed in the direction designated by the arrow A. More particularly the drawing assembly 1 provides for one or more motorized drawing wheels 2a and lor 2b, preferably fixed, positioned on the lower side of the progress pathway P, and three contrasting wheels 3a, 3b and 3c, preferably movable, positioned on the upper side of the progress pathway P. The drawing wheels 2a, 2b can have different diameter size with regard to the contrasting wheels 3a, 3b and 3c.

[0016] The contrasting wheels 3a, 3b and 3c are carried by an operating device 4, able to effect the displacement of the same contrasting wheels 3a, 3b and 3c between a lifted opening position (fig. 2) and a lowered position (figs. 1, 4 and 5) in which these contrasting wheels 3a, 3b and 3c are pressed towards the underlying drawing wheels 2a, 2b.

[0017] The operating device 4 preferably provides for only one actuator member 5 fitted on a substantially horizontal axis between a couple of arms 6 of levers 9, practically square-shaped and pivoted on pivots 7 to respective abutments 8 rising from the fixed framework 10 of the drawing assembly. The lever 9 are constrained each other by a connecting crosspiece 11 hinged on the pins 12 to the levers 9. The crosspiece 11 and the levers 9 push the stems 14 in order to keep the underlying contrasting wheels 3a, 3b and 3c in position.

[0018] More precisely, as it is shown in detail in fig.3, the axis 13 of the contrasting wheels 3a, 3b and 3c is carried by a prismatic slide 15 that is inserted in a sliding way inside a vertically developed seat 16. The slide 15 is constrained to the stem 14 and is subjected to the opposed action of an elastic member inserted in a suitable hollow 17, practically coaxial to the stem 14.

[0019] The seat 16 and the hollow 17 are realized in the framework 10 that also carries rotating the drawing wheels 2a, 2b.

[0020] The operation of the extension of the actuator member 5 brings about the widening of the arms 6, accordingly the angular rotation of the levers 9 and the lifting of the crosspiece 11, thus producing the simultaneous lifting, by means of the stems 14 and thanks to the springs inserted in the respective hallows 17, of the contrasting wheels 3a, 3b and 3c, to the opening position of the drawing assembly 1 (see fig. 2).

[0021] The opposite closing motion of the actuator member 5 obviously determines the simultaneous lowering of the contrasting wheels 3a, 3b and 3c to the operational position of the drawing assembly 1 (see fig.1) and the compression of said springs.

[0022] It should be noted that in this particular preferred embodiment the contrasting wheel 3c that is positioned centrally, constrained to the crosspiece 11, performs a larger travel than the side wheels 3a, 3b do, so that in the cited operational position it appears positioned at a height slightly lower than the said side wheels 3a, 3b. On the contrary in the lifted position the contrasting wheels 3a, 3b and 3c appear substantially aligned on the same horizontal plane.

[0023] According to the invention, at least one of the side contrasting wheels 3a, 3b is fitted rotating on an axis that is not perfectly superimposed with regard to the vertical plane passing through the axis of the underlying wheel and is so displaced in longitudinal direction to the progress pathway P of the sections with regard to the

axis of an opposed drawing wheel 2a, 2b it co-operates with, to define this curved progress pathway P.

[0024] More particularly, according to a preferred embodiment of the drawing assembly 1, in which the horizontal straightening members are disposed immediately upstream of the drawing assembly 1, the only contrasting wheel 3b positioned downstream appears displaced along the progress direction of the sections with regard to the axis of the opposed drawing wheel 2b (see figs. 1 and 2). On the contrary the upstream contrasting wheel 3a is vertically aligned to the opposed drawing wheel 2a.

[0025] The positioning of the contrasting wheel 3b placed downstream of the opposed drawing wheel 2b determines an amplitude increase of the arc of the curved pathway P for which the sections wind on the same drawing wheel 2b, since the sections coming out of the drawing assembly 1 are slightly pushed downwards by the contrasting wheel 3b. This increase of the winding arc produces a further reduction of the specific pressure, so as to avoid the risk of possible damages of the sections.

[0026] A further advantage is the rise of a yielding effect on the sections, so as, in practise, to perform a preliminary straightening action of the sections on the plane in which they are lying.

[0027] In fig. 4 a different embodiment of the drawing assembly 1 according to the invention is shown, in which both side contrasting wheels 3a, 3b appear displaced externally with regard to the vertically aligned position as to the opposed drawing wheels 2a, 2b. In particular the upstream contrasting wheel 3a appears displaced upstream along the curved pathway P, that is towards the entry of the drawing assembly 1, while the downstream contrasting wheel 3b is displaced downstream, that is towards the exit of the drawing assembly 1.

[0028] In this way the cited increase of the winding arc concern both couples of wheels 2a, 3a and 2b, 3c, bringing about a consequent advantage to the adhesion of the drawing wheels 2a, 2b and to the grip of the sections. This solution can be usefully used in case the horizontal straightening members are positioned at a suitable distance upstream of the drawing assembly 1, in order to avoid the possible fleeting of the sections, that are slightly pushed downwards by the contrasting wheel 3a at the entrance of the drawing assembly 1. In practise, since these machines allow to work more than one rod, this downward push would otherwise bring about an effect on the rod engaging the last wheel of the preceding horizontal straightening assembly, that would position the rods outside the provided groove and in different way for each of them, causing so the cited straightening irregularities.

[0029] On the contrary, that is if the horizontal straightening members are positioned close upstream of the drawing assembly 1, in order to avoid fleeting of the sections, it is possible to provide for a support pin 18 at the entry zone of the drawing assembly 1, as it is shown in fig. 5 The support pin 18 is carried rotating by the fixed framework 10 in such a position that it substantially appears tangent to the horizontal plane of upper tangency to the drawing wheels 2a, 2b.

[0030] The drawing assembly according to the invention reaches so the aim of improving the adhesion of the drawing wheels and the grip on the sections to be fed in a significant way, reducing as well the specific pressure exerted on the metal sections, so as to avoid possible damages of the sections. This is obtained thanks to the displacement along the longitudinal direction of only one or both of the side contrasting 3a, 3b with regard to the vertical lying plane of the axes of the opposed drawing wheels 2a, 2b they cooperate with to define the curved progress pathway P, so as to proportionally increase the winding arc of the sections on the said drawing wheels 2a, 2b, together with the action exerted by the central contrasting wheel 3c.

[0031] The lowering of the central contrasting wheel 3c has to be greater for smaller diameters. This fact is naturally solved thanks to the kinematic motion disclosed in this preferred embodiment that, thanks to the so-called "lever effect", gives the side stems 14 different displacements in comparison with the central stem. The two stems are moved by the same arm 9, which gives different displacements rotating around the fulcrum constituted by the pivots 7, because of the different distances from the same fulcrum of the side stems 14 and of the central stem. Obviously it is possible to obtain the same effect by means of independent actuators or of other different known kinematic motions.

[0032] Should the natural kinematic adjustment turn out to be not sufficient, it is possible to carry out an additional or an alternative adjustment as to what previously described with a manual method, for example by means of suitable screw members 25 (see figs. 3 and 4), or automatically. The screw members 25 act on the stem 14 housed in the crosspiece 11.

[0033] A device 20 adjusting the lowering travel imposed to the central contrasting wheel 3c by the interposition of differentiated shims is illustrated in the figs. 6, 7 and 8. The adjustment device 20 provides for a body 21 fitted in a suitable housing realized in the crosspiece 11, in the coupling seat 19 for the stem 14. The body 21 carries, on a support frame 22 extended transversally with regard to the crosspiece 11, a linear actuator member 23 able to set the shim 24 in motion. This shim 24 fits in above the seat 19 so as to displace the stem 14 more downwards.

[0034] This allows the fact that the sections with smaller diameter, that are as such less rigid, are pressed more by means of the central contrasting wheel 3c, in order to have a wider winding arc on the drawing wheels 2a, 2b. The adjustment becomes necessary to amplify the proportionality of the displacements, should result the kinematic effect based on the levers not sufficient.

[0035] In the previous description it is shown the embodiment with a five wheels drawing assembly (two lower ones and three upper ones), nevertheless it is obviously possible to suitably increase the number of wheels based

on the same principle, for example till seven wheels (three lower ones and four upper ones).

[0036] Materials adopted for the actual realization of the invention, as well as their shapes and sizes, can be various, depending on the requirements.

[0037] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly such reference signs do not have any limiting effect on the scope of each element identified by way of example by such reference signs.

Claims

1. Drawing assembly in machines for working metal sections, comprising a set of drawing wheels (2a, 2b) suitably motorized and a set of contrasting wheels (3a, 3b, 3c), fit to determine between them a curved progress pathway (P) for the metal sections to be fed,
   characterized in that
   one at least of said contrasting wheels (3a, 3b) is fitted rotating on an axis displaced in longitudinal direction to said progress pathway (P) with regard to the vertical lying plane of the axis of an opposing drawing wheel (2a, 2b) it co-operates with, to define said progress pathway (P) for said sections
   and **in that**
   at least the side contrasting wheel (3b) positioned downstream appears displaced in the progress direction (A) for said sections with regard to the lying vertical plane of the axis of said opposed drawing wheel (2b),
   so that such positioning of said contrasting wheel (3b) placed downstream of the opposed drawing wheel (2b) determines an amplitude increase of the arc of the said curved pathway (P) for which the sections wind on the same drawing wheel (2b), since the sections coming out of the drawing assembly (1) are slightly pushed downwards by the contrasting wheel (3b).

2. Drawing assembly according to the claim 1, **characterized in that** it comprises a couple of drawing wheels (2a, 2b), positioned with fixed axis on the lower side of the said progress pathway (P), a couple of side contrasting wheels (3a, 3b), opposed to said drawing wheels (2a, 2b) and a central contrasting wheel (3c), said contrasting wheels (3a, 3b, 3c) being positioned mobile on the upper side of the said progress pathway (P), at least one of the said side contrasting wheels (3a, 3b) being displaced in longitudinal direction with regard to the vertical lying plane of the axis of said opposed drawing wheel (2a, 2b).

3. Drawing assembly according to claim 1 **characterized in that** the only side contrasting wheel (3b) positioned downstream appears displaced in the progress direction (A) for said sections with regard to the lying vertical plane of the axis of said opposed drawing wheel (2b).

4. Drawing assembly according to claim 2, **characterized in that** both said side contrasting wheels (3a, 3b) appear displaced in longitudinal direction, respectively downstream and upstream, with regard to the respective vertical lying plane of the axis of said opposed drawing wheels (2a, 2b).

5. Drawing assembly according to claim 1, **characterized in that** it comprises a support pin (18) for the said sections, carried rotating at the entry zone of the same drawing assembly, in such a position that it appears substantially tangent to the horizontal plane of upper tangency to the said drawing wheels (2a, 2b).

6. Drawing assembly according to claim 1, **characterized in that** said contrasting wheels (3a, 3b, 3c) are carried by an operational device (4) able to perform the displacement of the same contrasting wheels (3a, 3b, 3c) between a lifted opening position and a lowered position, in which the same contrasting wheels (3a, 3b, 3c) are pressed towards said drawing wheels (2a, 2b).

7. Drawing assembly according to claim 6, **characterized in that** said operational device (4) provides for an actuator member (5) fitted between a couple of arms (6) of respective levers (9) pivoted on a fixed framework (10) and constrained each other by a crosspiece (11) acting respectively on a substantially vertical stem (14), for the simultaneous motion of the said contrasting wheels (3a, 3b, 3c).

8. Drawing assembly according to claim 7, **characterized in that** the axis (13) of said contrasting wheels (3a, 3b, 3c) is carried by a prismatic slide (15) constrained to said substantially vertical stem (14) and inserted in a sliding way in a vertically developed seat (16).

9. Drawing assembly according to claim 7, **characterized in that** said central contrasting wheel (3c), constrained to said crosspiece (11), performs a travel of different amplitude in comparison with the side contrasting wheels (3a, 3b).

10. Drawing assembly according to claim 2, **characterized in that** said central contrasting wheel (3c) lowers in an inversely proportional way as to the diameter of the said metal sections in progress of being worked.

11. Drawing assembly according to claim 2, **characterized in that** the position of the said central contrasting wheel (3c) is adjustable in an independent way.

12. Drawing assembly according to claim 2, **characterized in that** said central contrasting wheel (3c) is adjustable by the interposition of differentiated shims (24) at the stem (14) which is fit to set in motion the same wheel (3c).

13. Drawing assembly according to claim 1, **characterized in that** said drawing wheels (2a, 2b) have different diameter sizes in comparison with said contrasting wheels (3a, 3b, 3c).

Patentansprüche

1. Ziehanordnung in Maschinen für die Verarbeitung von Metallprofilen, die eine Reihe von zweckmäßig motorisierten Zugrollen (2a, 2b) und eine Reihe von Gegenrollen (3a, 3b, 3c) umfasst, die geeignet sind, zwischen sich einen kurvenförmigen Vorschubweg (P) für die zuzuführenden Metallprofile festzulegen, **dadurch gekennzeichnet, dass**
mindestens eine dieser Gegenrollen (3a, 3b) um eine Achse drehbar montiert ist, die in Längsrichtung zu diesem Vorschubweg (P) bezogen auf die vertikale Lageebene der Achse einer entgegengesetzten Zugrolle (2a, 2b) verschoben ist, mit der sie zusammenarbeitet, um diesen Vorschubweg (P) der Profile zu definieren,
und dadurch, dass
zumindest die danach angeordnete Gegenrolle (3b) in der Vorschubrichtung (A) der Profile bezogen auf die vertikale Lageeb e n e der Achse der entgegengesetzten Zugrolle (2b) verschoben ist,
so dass diese Anordnung der nach der entgegengesetzten Zugrolle (2b) angeordneten Gegenrolle (3b) eine Vergrößerung der Weite des Bogens des kurvenförmigen Vorschubwegs (P) bedingt, derentwegen sich die Profile auf das Rad (2b) wickeln, weil die aus der Ziehanordnung (1) austretenden Profile von der Gegenrolle (3b) leicht nach unten gedrückt werden.

2. Ziehanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** sie ein Paar Zugrollen (2a, 2b), die mit fester Achse auf der unteren Seite des Vorschubwegs (P) angeordnet sind, ein Paar diesen Zugrollen (2a, 2b) entgegengesetzte seitliche Gegenrollen (3a, 3b) und eine mittlere Gegenrolle (3c) umfasst, wobei die Gegenrollen (3a, 3b, 3c) auf der oberen Seite des Vorschubwegs (P) beweglich angeordnet sind, wobei mindestens eine der seitlichen Gegenrollen (3a, 3b) in Längsrichtung bezogen auf die vertikale Lageebene der Achse der entgegengesetzten Zugrolle (2a, 2b) verschoben ist.

3. Ziehanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** nur die stromabwärts angeordnete seitliche Gegenrolle (3b) in der Vorschubrichtung (A) der Profile bezogen auf die vertikale Lageebene der Achse der entgegengesetzten Zugrolle (2b) verschoben ist.

4. Ziehanordnung nach Anspruch 2, **dadurch gekennzeichnet, dass** beide seitlichen Gegenrollen (3a, 3b) in Längsrichtung stromaufwärts beziehungsweise stromabwärts bezogen auf die vertikale Lageebene der Achse der entgegengesetzten Zugrollen (2a, 2b) verschoben sind.

5. Ziehanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** sie eine auf Höhe des Eingangsbereichs der Ziehanordnung drehbar getragene Stützrolle (18) für die Profile in einer solchen Position umfasst, dass sie im Wesentlichen tangential zur waagrechten oberen Tangentialebene der Zugrollen (2a, 2b) ist.

6. Ziehanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Gegenrollen (3a, 3b, 3c) von einer Antriebsvorrichtung (4) getragen werden, die imstande ist, die Verschiebung der Gegenrollen (3a, 3b, 3c) zwischen einer angehobenen Öffnungsstellung und einer abgesenkten Stellung zu bewerkstelligen, in der die Gegenrollen (3a, 3b, 3c) in Richtung der Zugrollen (2a, 2b) gedrückt werden.

7. Ziehanordnung nach Anspruch 6, **dadurch gekennzeichnet, dass** die Antriebsvorrichtung (4) ein Aktuatorelement (5) vorsieht, das zwischen ein Armpaar (6) jeweiliger Hebel (9) montiert ist, die an einen festen Rahmen (10) angelenkt und durch einen Querstab (11) aneinander gefesselt sind, der jeweils auf einen im Wesentlichen vertikalen Schaft (14) für die gleichzeitige Bewegung der Gegenrollen (3a, 3b, 3c) wirkt.

8. Ziehanordnung nach Anspruch 7, **dadurch gekennzeichnet, dass** die Achse (13) der Gegenrollen (3a, 3b, 3c) von einem Prismenschlitten (15) getragen wird, der an den im Wesentlichen vertikalen Schaft (14) gefesselt und verschiebbar in einen Sitz (16) mit vertikaler Ausdehnung eingesetzt ist.

9. Ziehanordnung nach Anspruch 7, **dadurch gekennzeichnet, dass** die an den Querstab (11) gefesselte mittlere Gegenrolle (3c) einen Hub mit einer anderen Weite als die seitlichen Gegenrollen (3a, 3b) ausführt.

10. Ziehanordnung nach Anspruch 2, **dadurch gekennzeichnet, dass** sich die mittlere Gegenrolle (3c) umgekehrt proportional zum Durchmesser der verarbeiteten Metallprofile absenkt.

11. Ziehanordnung nach Anspruch 2, **dadurch gekennzeichnet, dass** die mittlere Gegenrolle (3c) eine unabhängig einstellbare Position hat.

12. Ziehanordnung nach Anspruch 2, **dadurch gekennzeichnet, dass** die mittlere Gegenrolle (3c) durch das Einfügen von differenzierten Abstandscheiben (24) auf Höhe des Schafts (14) für die Bewegung der Rolle (3c) eingestellt werden kann.

13. Ziehanordnung nach Anspruch 1, **dadurch gekennzeichnet, dass** die Zugrollen (2a, 2b) andere Durchmessermaße als die Gegenrollen (3a, 3b, 3c) aufweisen.

Revendications

1. Mécanisme d'étirage destiné aux machines pour travailler des sections de métal, comprenant une série de roues d'étirage (2a, 2b) opportunément motorisées e une série de roues de contraste (3a, 3b, 3c), propres à déterminer entre elles un parcours d'avancement (P) curviligne pour les sections de métal à alimenter,
caractérisé en ce que
au moins une desdites roues de contraste (3a, 3b) est montée tournante sur un axe déplacé en direction longitudinale audit parcours d'avancement (P) par rapport au plan vertical où se situe l'axe d'une roue d'étirage opposée (2a, 2b) avec laquelle elle coopère pour définir ledit parcours d'avancement (P) desdites sections
et **en ce que**
au moins la roue latérale de contraste (3b) positionnée en aval apparaît déplacée selon la direction d'avancement (A) desdites sections par rapporta u plan vertical où se situe l'axe de ladite roue d'étirage opposée (2b),
de sorte qu'un tel positionnement de ladite roue de contraste (3b) placée en aval de la roue d'étirage opposée (2b) détermine une augmentation d'amplitude de l'arc dudit parcours curviligne (P) pour lequel les sections s'enroulent sur la même roue d'étirage (2b), puisque les sections en sortie du mécanisme d'étirage (1) sont légèrement poussées vers le bas par la roue de contraste (3b).

2. Mécanisme d'étirage selon la revendication 1, **caractérisé en ce qu'**il comprend une paire de roues d'étirage (2a, 2b), disposées avec axe fixe sur le côté inférieur dudit parcours d'avancement (P), une paire de roues de contraste (3a, 3b) latérales, opposées auxdites roues d'étirage (2a, 2b), et une roue de contraste (3c) centrale, lesdites roues de contraste (3a, 3b, 3c) étant disposées mobiles sur le côté supérieur dudit parcours d'avancement (P), au moins une desdites roues de contraste (3a, 3b) latérales étant déplacée en direction longitudinale par rapport au plan vertical où se situe l'axe de ladite roue d'étirage (2a, 2b) opposée.

3. Mécanisme d'étirage selon la revendication 1, **caractérisé en ce que** seule la roue de contraste (3b) latérale positionnée en aval apparaît déplacée selon la direction (A) d'avancement desdites sections par rapport au plan vertical où se situe l'axe de ladite roue d'étirage (2b) opposée.

4. Mécanisme d'étirage selon la revendication 2, **caractérisé en ce que** les deux dites roues de contraste (3a, 3b) latérales apparaissent déplacées selon la direction longitudinale, respectivement à mont et à val, par rapport au plan vertical respectif où se situe l'axe desdites roues d'étirage (2a, 2b) opposées.

5. Mécanisme d'étirage selon la revendication 1, **caractérisé en ce qu'**il comprend un rouleau de support (18) desdites sections, porté tournant au niveau de la zone d'entrée du même mécanisme d'étirage, dans une position telle qu'elle apparaît essentiellement tangente au plan horizontal de tangence supérieure auxdites roues d'étirage (2a, 2b).

6. Mécanisme d'étirage selon la revendication 1, **caractérisé en ce que** lesdites roues de contraste (3a, 3b, 3c) sont porte par un dispositif d'actionnement (4) propre à opérer le déplacement des mêmes roues de contraste (3a, 3b, 3c) entre une position soulevée d'ouverture et une position abaissée, dans laquelle les mêmes roues de contraste (3a, 3b, 3c) sont pressées en direction desdites roues d'étirage (2a, 2b).

7. Mécanisme d'étirage selon la revendication 6, **caractérisé en ce que** ledit dispositif d'actionnement (4) prévoit un membre déclencheur (5) monté entre une paire de bras (6) de leviers (9) respectifs pivotés sur un cadre fixe (10) et liés l'un à l'autre par une traverse (11) agissant respectivement sur une tige (14), essentiellement verticale, pour la mise en mouvement simultanée desdites roues de contraste (3a, 3b, 3c).

8. Mécanisme d'étirage selon la revendication 7, **caractérisé en ce que** l'axe (13) desdites roues de contraste (3a, 3b, 3c) porté par un chariot prismatique (15) lié à ladite tige (14) essentiellement verticale et de façon coulissante dans un siège (16) à développement vertical.

9. Mécanisme d'étirage selon la revendication 7, **caractérisé en ce que** ladite roue de contraste (3c) centrale, liée à ladite traverse (11), accomplit une course d'amplitude différente par rapport aux roues

de contraste (3a, 3b) latérales.

10. Mécanisme d'étirage selon la revendication 2, **caractérisé en ce que** ladite roue de contraste (3c) centrale s'abaisse de façon inversement proportionnelle au diamètre desdites sections de métal en production.

11. Mécanisme d'étirage selon la revendication 2, **caractérisé en ce que** ladite roue de contraste (3c) centrale a une position réglable de façon autonome.

12. Mécanisme d'étirage selon la revendication 2, **caractérisé en ce que** ladite roue de contraste (3c) centrale est réglable par l'interposition d'épaisseurs (24) différentiées au niveau de la tige (14) de mise en mouvement de la même roue (3c).

13. Mécanisme d'étirage selon la revendication 1, **caractérisé en ce que** lesdites roues d'étirage (2a, 2b) ont des dimensions diamétrales différentes par rapport auxdites roues de contraste (3a, 3b, 3c).

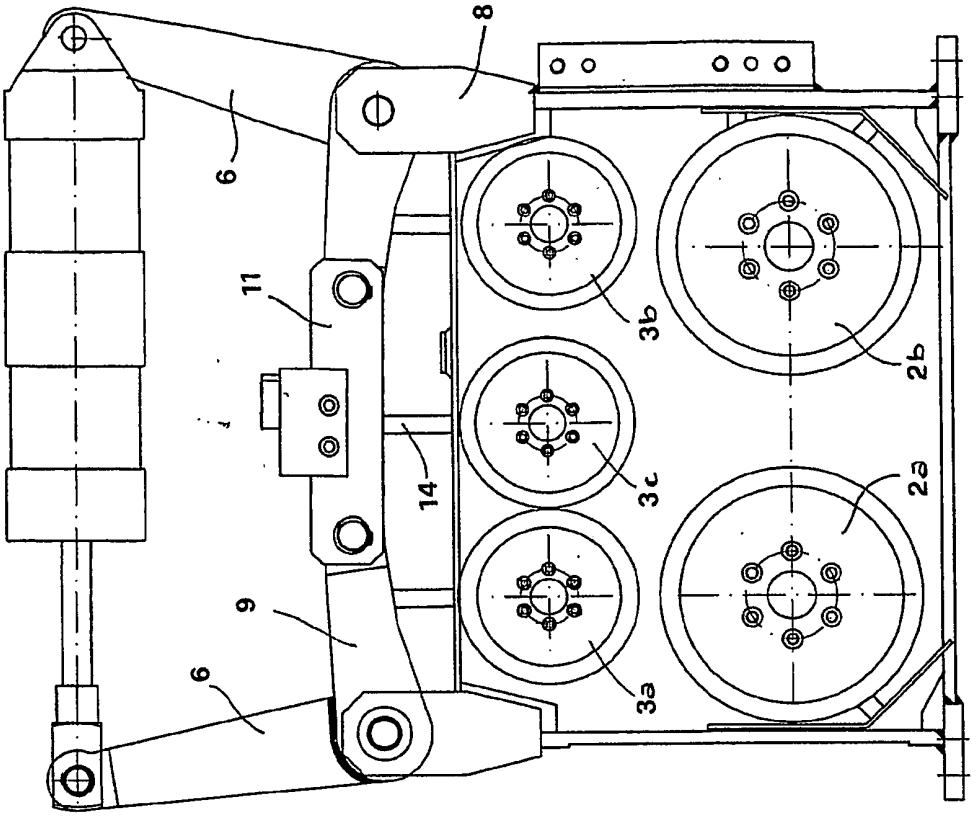

8
6
11
14
9
6
3b
3c
3a
2b
2a

FIG.2

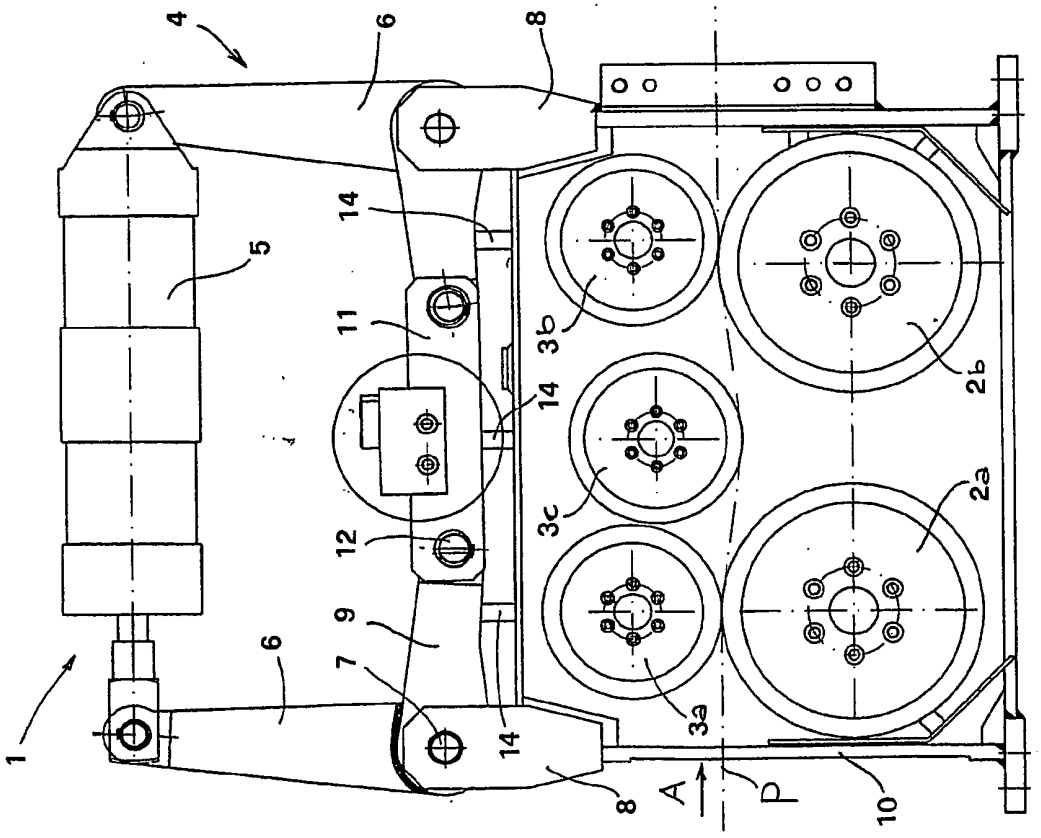

4
6
8
14
5
11
3b
14
12
3c
9
7
6
14
1
8
A
P
10
2b
2a
3a

FIG.1

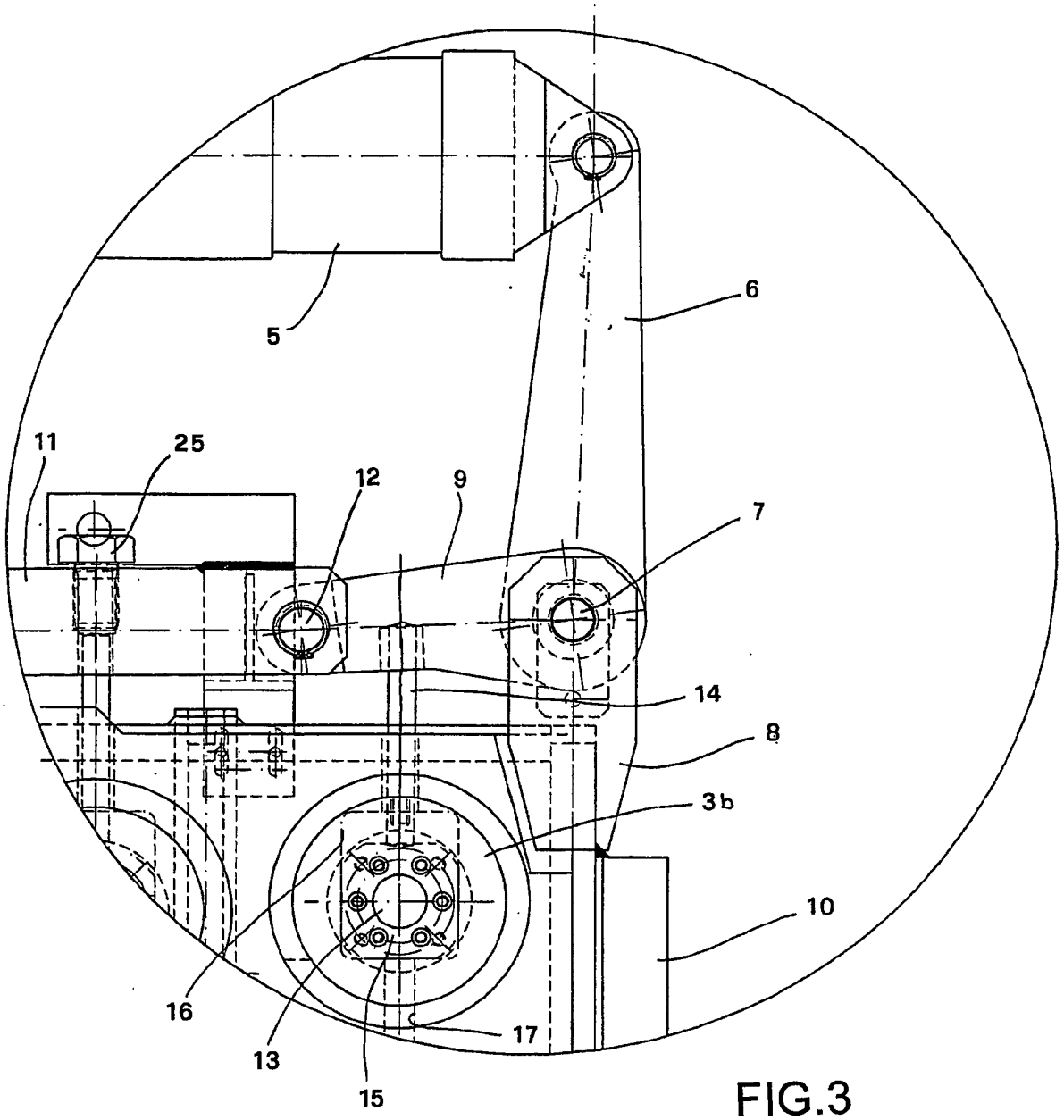


FIG.3

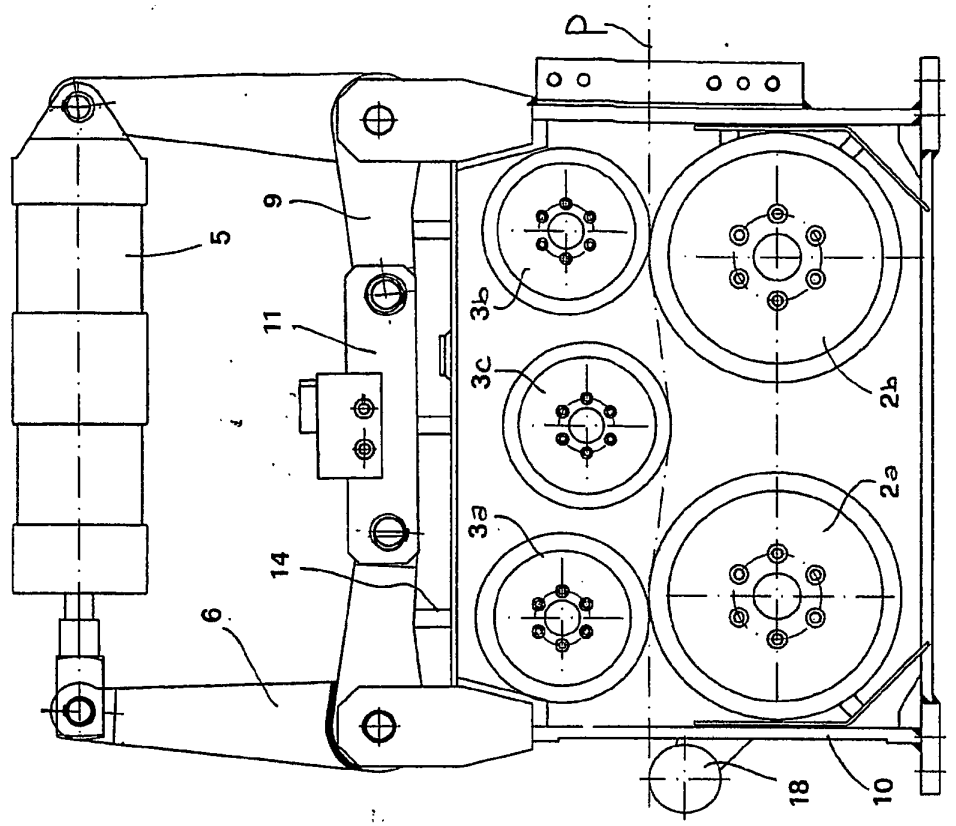


FIG. 5

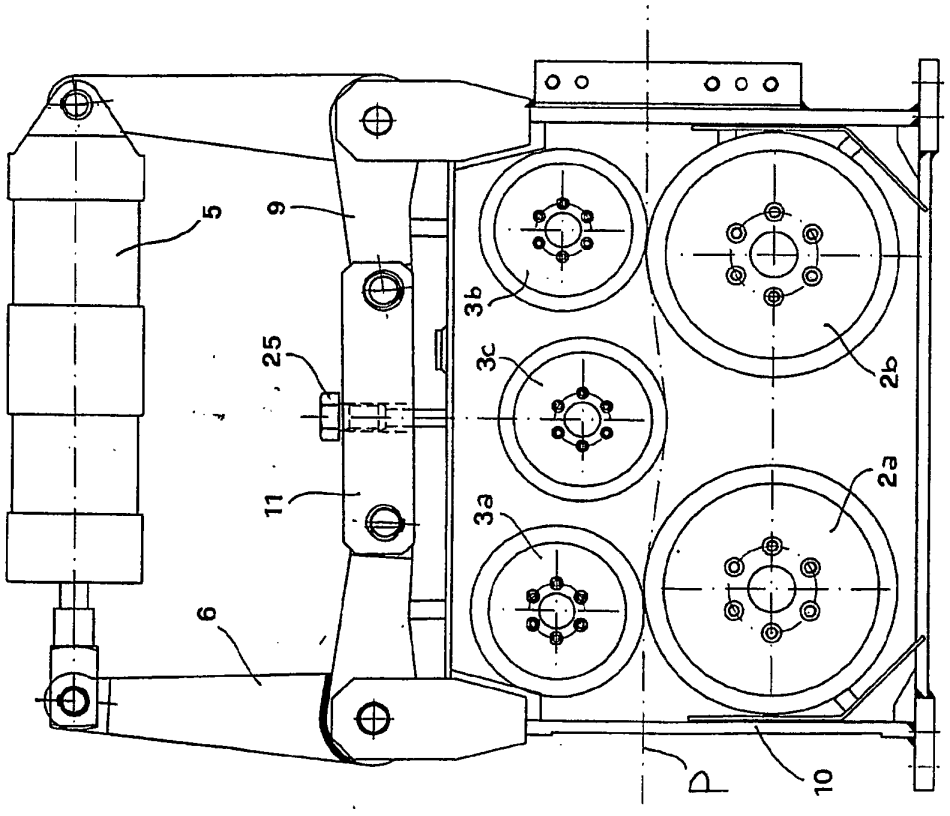


FIG.4

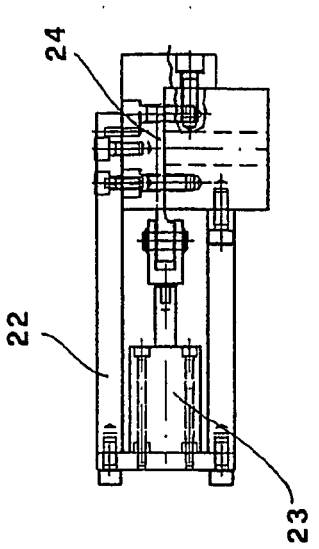


FIG.8

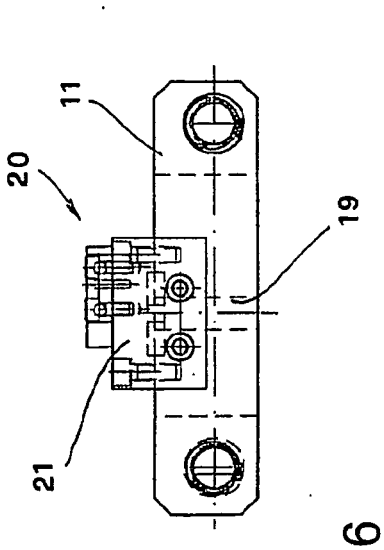


FIG. 6

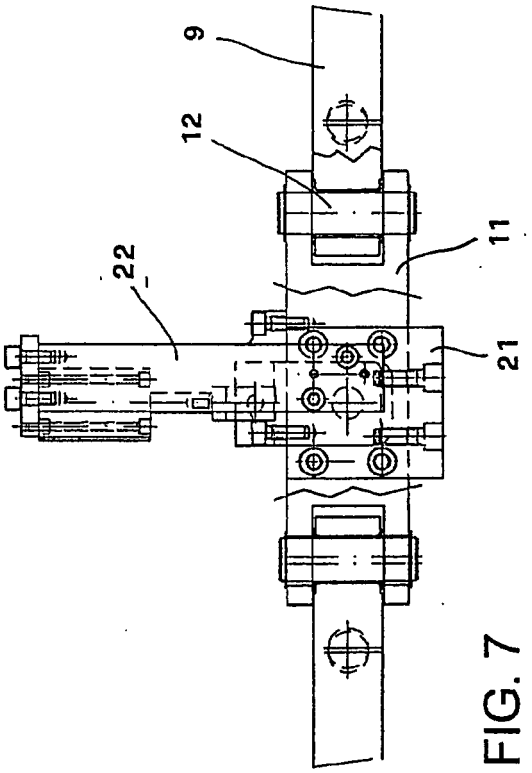


FIG. 7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- IT 1038796 **[0005]**
- GB 1454738 A **[0005]**