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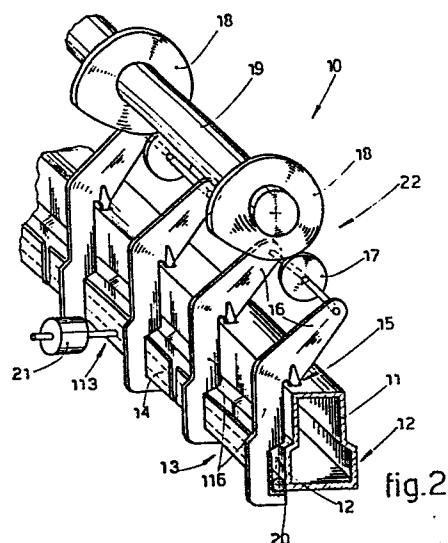
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54 Brake device for rolled bars.

57 This invention concerns a device (10) to brake a rolled bar (20) leaving a rolling line and to deposit such bar (20) thereafter on a cooling plate, which device (10) comprises in coordinated cooperation:

- support means (11) having brake path means (12),
- brake panel means (13) which act at least momentarily on the rolled bar (20) with at least a component of the weight of the brake panel means (13), and
- actuation means (22).



25 A further purpose of this invention is to provide a brake

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1 device advantageously having an action which can be graduated
2 and adjusted to suit the type and speed of the rolled product.

3 According to the invention such purposes together with
4 others again which will become obvious hereinafter in the des-
5 cription and drawings are fulfilled by arranging a series of
6 brake panels rotatably secured to a support element.

7 Such brake panels are specifically shaped in such a way as
8 to constrain the rolled product between a suitably shaped por-
9 tion of the panels themselves and a flat slide path present on
10 the side of the central support element.

11 The force of lateral friction to brake the rolled product
12 is provided advantageously by a component of the weight of the
13 panel itself; this component therefore presses the rolled pro-
14 duct sideways against the brake path present on the central
15 support element.

16 If a suitable conformation of the brake panels is adopted,
17 the rolled product becomes constrained, according to the in-
18 vention, between a substantially horizontal surface in the
19 lower part of the panel and two substantially vertical sur-
20 faces.

21 One of these substantially vertical surfaces is formed by a
22 surface of the panel, whereas the other is formed by a station-
23 ary brake path which is a part of the central support element.

24 The invention furthermore visualises means for coordinated
25 actuation of the panels. Actuation of each panel can be per-
26 formed, for instance, by a cam which actuates a cam follower
27 means located at the end of an arm solidly fixed to the panel.

28 We shall refer hereinafter specifically to this particular
29 method of actuation, but it is not intended in this way to
30 restrict the invention to this type of actuation, for it re-
31 mains within the concept of the invention itself to employ
32 equivalent means, whether mechanical, pneumatic, hydraulic,
33 electromagnetic or a combination of the same.

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1 According to the invention the actuation is negative in the
2 sense that the action of the cam located above the panel
3 causes the panel itself to be moved away from the slide path.
4 This causes the release of the rolled bar and the fall of the
5 same onto the cooling bed, whereas the braking action is
6 operated positively but is operated by the weight itself of
7 the panel, it being possible for this weight to be graduated
8 perhaps by means of the cam or by appropriate means provided
9 for the purpose.

10 According to its simplest formulation the invention envis-
11 ages that, when braking takes place, the cam disengages itself
12 fully from the cam follower means and frees the panel, which
13 is thus free to press with a component of its own weight
14 against the rolled product and to constrain the latter against
15 the brake path.

16 In this simplest formulation of the invention the cam is so
17 shaped that the panel can take up three positions substantial-
18 ly:

- 19 - a position for entry of the rolled product; in this position
20 the rolled product rests on a substantially horizontal sur-
21 face of the panel but is not pressed sideways;
- 22 - a braking position, in which the cam releases the panel,
23 which, owing to its own weight, thrusts the rolled product
24 sideways against a brake path;
- 25 - a released position, in which the cam causes the panel to
26 move away from the brake path in such a way as to release
27 the rolled product, which then falls onto the cooling plate.

28 The invention envisages advantageously that a timing compo-
29 nent is embodied in the cams which actuate the various panels
30 in succession, so that the action of the panels is synchroni-
31 zed with the entry and the sliding of the rolled product into
32 the braking zone.

33 The start of the braking is governed by a sensor which

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1 senses the passage of the rolled product; such sensor can be,
2 for instance, of an optoelectronic type or other equivalent
3 type.

4 As we said earlier, it is possible according to the invent-
5 ion to provide actuation means of a different type, whether
6 pneumatic, electromagnetic, mechanical or a combination of the
7 same, which carry out in every case the three phases of entry,
8 braking and discharge respectively, it being possible in such
9 a case for braking to be graduated or to be capable of being
10 graduated.

11 The invention envisages advantageously the ability to equip
12 each panel with one or more counterweights which can be suit-
13 ably adjusted so as to be able to regulate the force of frict-
14 ion due to the weight of the panel itself, depending on the
15 type of rolled product and its speed of sliding.

16 The invention is therefore embodied with a device to brake
17 a rolled bar leaving a rolling line and to deposit such bar
18 thereafter on a cooling plate, which device comprises in coor-
19 dinated cooperation:

- 20 - support means having brake path means,
21 - brake panel means which act at least momentarily on the
22 rolled bar with at least a component of the weight of the
23 brake panel means, and
24 - actuation means.

25 We shall describe hereinafter, as a non-restrictive exam-
26 ple, a preferred embodiment of the invention with the help of
27 the attached figures, in which:-

28 Fig.1 shows a view of the device of the invention in the
29 direction in which the rolled bar slides;

30 Fig.2 gives an overall view of the device itself, in which
31 the arrangement of the brake panels and of the actu-
32 ation means is made clear.

33 In the figures the device of the invention bears the

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1 reference number 10. A central support element 11 has on its
2 sides two substantially vertical brake paths 12.

3 Fig.1 shows a brake panel 13 positioned at one side of the
4 central support element 11. This panel 13 includes a portion
5 14 for constraintment of rolled bars, the portion 14 being
6 shaped in such a way as to face the brake path 12.

7 The brake panel 13 is pivoted at 15 on the central support
8 element 11. In the figure the pivot 15 is shown with a knife-
9 edge suspension but could also consist of a pivot pin or other
10 equivalent means.

11 To ensure the stability of the panel 13, the pivot 15 is
12 envisaged as being multiple, for instance double as in Fig.2.
13 In fact it is advantageous that the panel should be suspended
14 at least at two points spaced apart lengthwise.

15 An arm 16, which may be single or multiple, is provided in
16 the upper portion of the panel 13 and is operated by actuation
17 means 22.

18 In the example shown the actuation means 22 consist of a
19 cam follower 17, constituted substantially of a wheel or
20 roller, and of a suitably shaped cam 18 supported on a shaft
21 19 moved by appropriate means not shown here.

22 In the example shown in Fig.2 the arm 16 is envisaged as
23 being double so as to obtain a two-point suspension in a
24 simple manner and so as to provide constructional simplicity.
25 The arms 16 extend so as to form ribs 116 solidly fixed to the
26 constraintment portion 14.

27 Rotation of the cam 18 causes displacement of the arm 16
28 and therefore of the constraintment portion 14 in relation to
29 the brake path 12.

30 The positions of the panel 13, depending on the rotation of
31 the cam 18, are as follows:-

32 a) entry of the rolled bar: the cam 18 in position 18A keeps
33 the panel 13 in position 13A. The rolled bar 20 enters the

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1 space between the substantially vertical inner surface 114
2 of the constraintment portion 14 and the brake path 12. Such
3 space is slightly greater than the width of the rolled bar
4 20. The rolled bar 20 slides and is supported on a lower
5 horizontal surface 214 of the constraintment portion 14.

6 b) braking action: a sensor, which is not shown here, actuates
7 rotation of the cam 18, which at position 18B releases the
8 cam follower 17 fully. The panel 13 at position 13B con-
9 strains the rolled bar 20 between the surface 114 of the
10 constraintment portion 14 and the path 12 arranged on the
11 central support element 11.

12 The rolled bar 20 thus begins to slide with friction on
13 three surfaces 114, 214 and 12 respectively; the force of
14 friction against the lower surface 214 is caused substantially
15 by the weight of the rolled bar 20, whereas the force of fric-
16 tion against the surfaces 114 and 12 at the sides of the rol-
17 led bar 20 is caused by the weight of the panel 13.

18 The invention envisages the possibility of applying a
19 counterweight 21 to the panel 13, as shown on a panel 113 in
20 Fig.2, for instance. Such counterweight 21 will be advantage-
21 ously adjustable or movable so as to vary as necessary the
22 sideways braking force applied to the rolled bar 20 according
23 to requirements.

24 The embodiment illustrated shows, for the sake of clarity,
25 only panels 13-113 positioned on one side of the central sup-
26 port element 11, but it is to be understood that according to
27 the invention two rows of panels 13 can be provided, one on
28 each side of the central support element 11, and be arranged
29 alternately.

30 The actuation cams 18 are located on the upper side of the
31 device 10 and are operated by one single shaft 19 in the
32 example shown.

33 These cams 18 can be suitably disposed out of phase with

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1 each other so as to obtain a desired succession of actuations
2 of the panels 13 in such a way that the panels 13 are released
3 and the rolled bar 20 is thus braked progressively, depending
4 on the position of the rolled bar 20; that is to say, by regu-
5 lating suitably the timings of the release of the panels 13 it
6 is possible to prevent a panel 13 from pressing against a rol-
7 led bar 20 if the end of the latter 20 has not already moved
8 to a position corresponding with the panel 13 itself.

9 We have described here a preferred embodiment of the inven-
10 tion but variants are possible without departing thereby from
11 the scope of the invention itself.

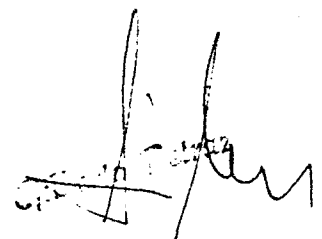
12 For instance, it is possible to position the actuation
13 means, such as the cams 18, differently by locating them at
14 the sides of the panels 13 rather than above the panels 13.

15 It is also possible to arrange for more than one cam 18-cam
16 follower 17 pair for each panel 13.

17 It is also possible to change the shapes and sizes of the
18 parts and also to vary the inclination of the surfaces 114,
19 214 and 12 on which the rolled bar 20 slides.

20 In the same way the actuation cam means 18 can be replaced
21 with mechanical equivalents such as electromagnets, jacks,
22 levers or other equivalent means. It is also possible to emp-
23 loy the device 10 in cooperation with other known brake means.

24 Further variants are possible for a person skilled in this
25 field without departing thereby from the scope of the basic
26 idea of the invention.

A handwritten signature in dark ink, located in the bottom right corner of the page. The signature is stylized and appears to be a personal name, possibly "J. H. Smith" or similar, though the exact characters are difficult to decipher due to the cursive style.

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1	<u>INDEX</u>
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3	11 - central support element
4	12 - brake path
5	13 - brake panel
6	13A - panel position for entry of rolled bar
7	13B - panel position to brake rolled bar
8	13C - panel position to discharge rolled bar
9	113 - panel with counterweight
10	14 - portion to constrain rolled bar
11	114 - brake surface
12	214 - brake surface
13	15 - pivot
14	16 - arm
15	116 - rib
16	17 - cam follower
17	18 - cam
18	18A - cam position for entry of rolled bar
19	18B - cam position to brake rolled bar
20	18C - cam position to discharge rolled bar
21	19 - shaft
22	20 - rolled bar
23	21 - counterweight
24	22 - actuation means.

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CLAIMS

1 - Device (10) to brake a rolled bar (20) leaving a rolling line and to deposit such bar (20) thereafter on a cooling plate, which device (10) comprises in coordinated cooperation:

- support means (11) having brake path means (12),
- brake panel means (13) which act at least momentarily on the rolled bar (20) with at least a component of the weight of the brake panel means (13), and
- actuation means (22).

2 - Device (10) to brake a rolled bar (20) as claimed in Claim 1, in which the brake panel means (13) are pivoted (15) on the support means (11).

3 - Device (10) to brake a rolled bar (20) as claimed in Claim 1 or 2, in which the brake panel means (13) can take up at least three distinct stable positions (13A-13B-13C).

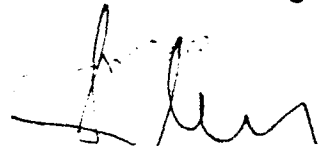
4 - Device (10) to brake a rolled bar (20) as claimed in any claim hereinbefore, in which the brake panel means (13) include at least one surface (114) substantially facing the brake path means (12), and one substantially horizontal surface (214).

5 - Device (10) to brake a rolled bar (20) as claimed in any claim hereinbefore, in which the actuation means (22) comprise cam means (18) acting on cam follower means (17) provided on an arm (16) of the brake panel means (13), and in which the arm (16) can be single or multiple.

6 - Device (10) to brake a rolled bar (20) as claimed in any of Claims 2 to 5 inclusive, in which the pivot (15) is of a knife-edge type.

7 - Device (10) to brake a rolled bar (20) as claimed in any of Claims 2 to 6 inclusive, in which the pivot (15) is a pin-wise pivot.

8 - Device (10) to brake a rolled bar (20) as claimed in any claim hereinbefore, in which the cam means (18) actuating

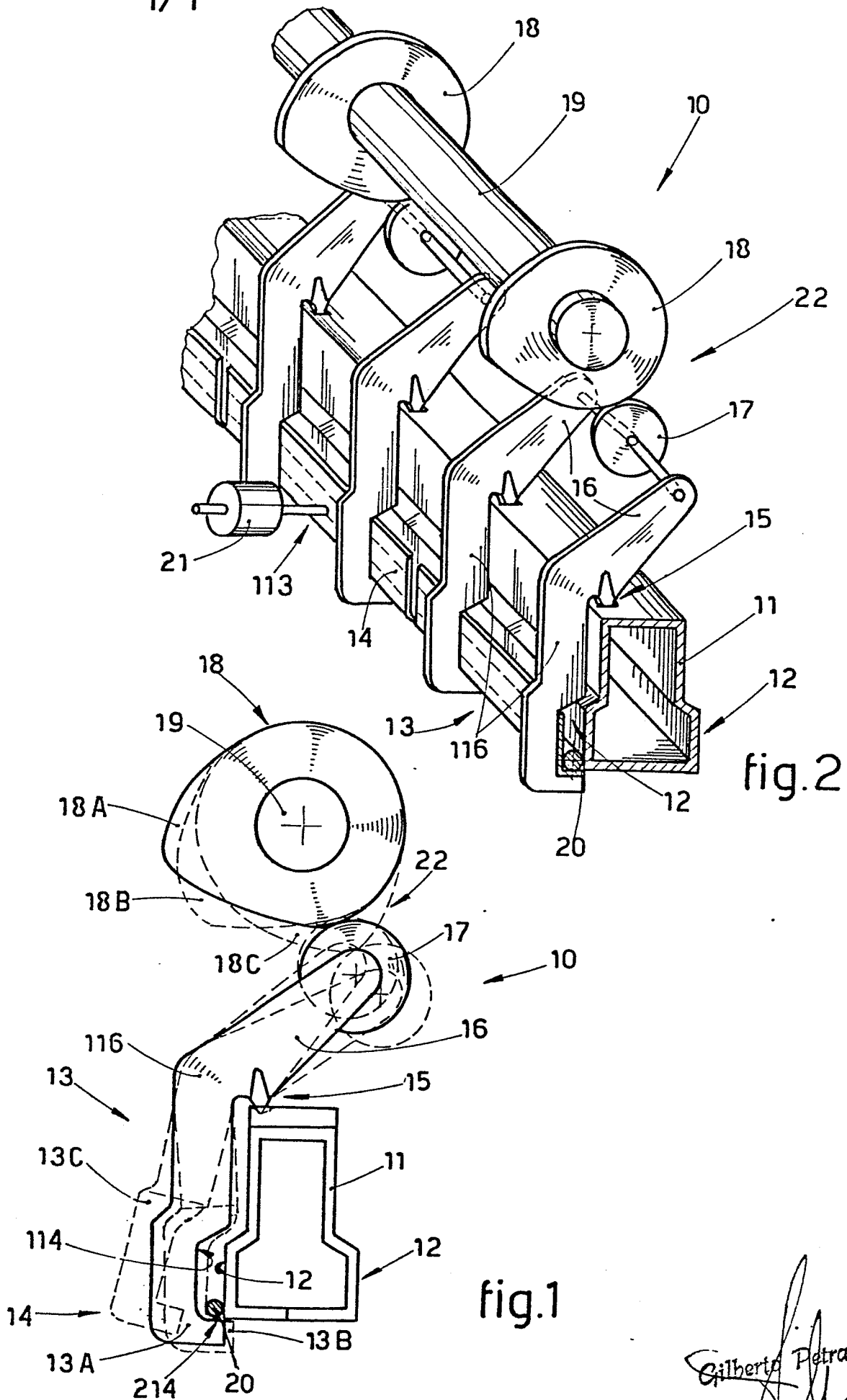


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1 successive panels (13) embody mutually out-of-phase timings
2 arranged as required.

3 9 - Device (10) to brake a rolled bar (20) as claimed in any
4 claim hereinbefore, in which the brake panel means (13) in-
5 clude counterweight means (21) which can be regulated advant-
6 ageously.

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