

APPLICATION ACCEPTED AND AMENDMENTS

ALLOWED

1-3-90

COMMONWEALTH OF AUSTRALIA

59 7283

Patents Act 1952

64657/86

CONVENTION APPLICATION FOR A STANDARD PATENT

~~XX~~WE, YOSHIDA KOGYO K.K. a corporation duly organized under the laws of Japan of No. 1, Kanda Izumi-cho, Chiyoda-ku, Tokyo, Japan

hereby apply for the grant of a Standard Patent for an invention entitled:

APPARATUS FOR SIMULTANEOUSLY COATING A PLURALITY OF SURFACE TYPE FASTENER TAPES OR LIKE STRIPS

~~which~~ is described in the accompanying complete specification.

This application is made under the provision of Part XVI of the Patents Act 1952 and is based on an application for a patent or similar protection made in Japan

on 11 November 1985

(No. 1723340
Sho 60-172334)

OR

~~XXX~~

My/Our address for service is:

F.B. RICE & CO.,
28A Montague Street,
Balmain NSW 2041

Dated this 31st day of October 1986

LODGED AT SUB-OFFICE

3 NOV 1986

Sydney

YOSHIDA KOGYO K.K.

By:

Registered Patent Attorney

To : The Commissioner of Patents
COMMONWEALTH OF AUSTRALIA



EP86-28-AJ

Commonwealth of Australia
The Patents Act 1952
DECLARATION IN SUPPORT

In support of the (Convention) Application made by:

YOSHIDA KOGYO K. K. of No. 1, Kanda Izumi-cho, Chiyoda-ku,
Tokyo, Japan

for a patent for an invention entitled:

APPARATUS FOR SIMULTANEOUSLY COATING A PLURALITY OF
SURFACE TYPE FASTENER TAPES OF LIKE STRIPS

I (~~We~~), Ichiro Agata, Director of Patent Department of YOSHIDA KOGYO K. K.
of and care of the applicant company do solemnly and sincerely declare as follows:

~~a) I am (We are) the applicant(s) for the patent~~

or

b) I am (~~We are~~) authorised by the applicant(s) for the patent to make this declaration on its behalf.

Delete the following if not a Convention Application.

The basic application(s) as defined by section 141 (~~142~~) of the Act was (~~were~~) made

in Japan on November 11, 1985

~~in on~~

~~in on~~

by YOSHIDA KOGYO K.K.

The basic application(s) referred to in this paragraph is (~~are~~) the first application(s) made in
a Convention country in respect of the invention the subject of the application.

~~a) I am (We are) the actual inventor(s) of the invention~~

or

b) Hissai Nishiyama: residing at 547, Hayaboshi, Fuchu-machi,
Nei-gun, Toyama-ken, Japan

is (~~are~~) the actual inventor(s) of the invention and the facts upon which

THE APPLICANT COMPANY
is (~~are~~) entitled to make the application are as follows:

The applicant is the assignee of the invention from the said
actual inventor

Declared at Tokyo, Japan this 8th day of October 1986

Signed Ichiro Agata Status Director of Patent Department

Declarant's Name Ichiro Agata

F. B. RICE & CO PATENT ATTORNEYS

This form is suitable for any type of Patent Application. No legalisation required.

(12) PATENT ABRIDGMENT **(11) Document No. AU-B-64657/86**
(19) AUSTRALIAN PATENT OFFICE **(10) Acceptance No. 597283**

(54) Title
APPARATUS FOR SIMULTANEOUSLY COATING A PLURALITY OF SURFACE TYPE FASTENER TAPES OR LIKE STRIPS

International Patent Classification(s)
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(56) Prior Art Documents
AU 48815/69 34.8 79.4

(57) Claim

1. A coating apparatus for simultaneously applying a desired coating substance to a plurality of surface type fastener tapes or like strips, each having a known width, traveling in a predetermined direction along a predetermined path in parallel relation to each other and with a predetermined spacing therebetween, the coating apparatus comprising:

- (a) a coating roller disposed across the predetermined path of the strips to be coated so as to be in coating contact therewith;
- (b) supply means for supplying the coating substance over the complete surface of the coating roller; and
- (c) a doctor blade having a scraping edge held against the surface of the coating roller for selectively scraping off the coating substance therefrom, the

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scraping edge of the doctor blade having defined therein a plurality of recesses each having a length ^{substantially} ~~approximately~~ equal to the width of each strip, the recesses having a spacing therebetween which is ~~ap~~ ^{substantially} ~~proximately~~ equal to the spacing between the strips;

- (d) whereby the doctor blade is effective to scrape off the coating substance only from those portions of the surface of the coating roller which do not make coating contact with the strips.

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COMPLETE SPECIFICATION
(ORIGINAL)

Class

Int. Class

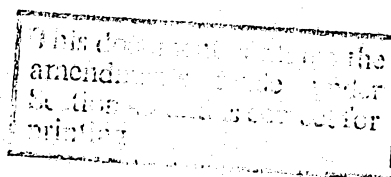
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Priority : 11 NOVEMBER 1985

Related Art :



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Complete Specification for the invention entitled:
APPARATUS FOR SIMULTANEOUSLY COATING A PLURALITY OF SURFACE
TYPE FASTENER TAPES OR LIKE STRIPS

The following statement is a full description of this invention
including the best method of performing it known to us :-

1 APPARATUS FOR SIMULTANEOUSLY COATING A PLURALITY OF
2 SURFACE TYPE FASTENER TAPES OR LIKE STRIPS
3

4 BACKGROUND OF THE INVENTION
5

6 This invention relates to a coating apparatus and more
7 specifically to an apparatus for coating one side of a plurality of
8 strips or tapes of fabrics, plastics or any other material at one
9 time so as to prevent the coated substance from flowing onto the
10 other sides of the strips. The coating apparatus of this invention
11 is of particular utility when used for applying a coating substance
12 to the rear sides of elongate surface type fastener tapes having a
13 multiplicity of hooks or loops on their front sides, in order to
14 firmly anchor such hooks or loops to their carrier fabric.

15 The surface type fastener is known which comprises one
16 fastener member having a multiplicity of hooks on a piece of carrier
17 fabric, and another fastener member having a multiplicity of loops
18 on another piece of carrier fabric. When pressed against each
19 other, the two fastener members fasten together as a result of the
20 interengagement of the hooks and loops. The hooks and loops are
21 disengageable when the fastener members are forced apart from each
22 other. In the manufacture of such surface type fasteners, fastener
23 tapes are prepared which are elongate strips of carrier fabric each
24 having hooks or loops on its front side. The rear sides of these
25 fastener tapes must be coated with a liquid which, when cured, can
26 provide a positive anchorage for the hooks or loops onto the car-
27 rier fabric.

28 The usual practice in the fastener industry for coating
29 the rear sides of the fastener tapes has been to feed a plurality
30 or multiplicity of such fastener tapes in coplanar, parallel spaced

1 relation to one another over a coating roller partly dipped in a
2 coating agent contained in a pan or any other open top vessel (as
3 will be later explained with reference to FIG. 8 of the drawings
4 attached hereto). However, if applied to the fastener tapes from
5 the complete surface of the coating roller, the coating agent will
6 readily permeate the longitudinal edge portions of the fastener
7 tapes, where they have no hooks or loops, and will thoroughly cover
8 the selvages of the fastener tapes which need not be coated.

9 So coated, the selvages of the fastener tapes will harden
10 upon curing of the coated liquid. Surface type fasteners are
11 usually attached to desired articles by stitching the selvages
12 thereto. The selvages hardened by excessive coating as above make
13 this stitching difficult and so impair the commercial value of the
14 fasteners.

15 Japanese Laid Open Patent Application No. 59-228970 and
16 Japanese Laid Open Utility Model Application No. 59-150561 suggest
17 a solution to this problem, both teaching the creation of a plu-
18 rality of circumferential channels in the surface of a coating
19 roller partly dipped in a desired coating liquid. As the strips to
20 be coated are fed in rolling engagement with the channeled coating
21 roller, the liquid is applied to the strips from the channels.

22 An objection to this known apparatus is that the thick-
23 ness and width of the coatings on the strips are determined by the
24 depth and width of the channels in the coating roller. Consequent-
25 ly, many coating rollers having different numbers, widths and
26 depths of channels must be manufactured and held in stock for coat-
27 ing different numbers and widths of strips to different thickness-
28 es. This conventional coating apparatus is therefore not adaptable
29 for a variety of applications without necessitating much cost for
30 the manufacture of many differently channeled coating rollers which

1 are very expensive.

2
3 SUMMARY OF THE INVENTION
4

5 The present invention provides an improved coating appa-
6 ratus whereby a desired coating agent can be applied only to one
7 side of each of a plurality or multiplicity of surface type fasten-
8 er tapes or other strips, without the possibility of the coating
9 agent flowing onto the other sides of the strips. The improved
10 apparatus of this invention is notable for its ready adaptability
11 for a variety of specific coating applications and requirements at
12 reduced cost.

13 Briefly, the invention may be summarized as a coating ap-
14 paratus for simultaneously applying a desired coating substance to
15 a plurality of surface type fastener tapes or like strips, each
16 having a known width, traveling in a predetermined direction along
17 a predetermined path in parallel relation to each other and with a
18 predetermined spacing therebetween. The coating apparatus com-
19 prises a coating roller disposed across the predetermined path of
20 the strips so as to be in coating contact therewith. A supply
21 means is provided for constantly supplying the coating substance
22 over the surface of the coating roller. Also included is a doctor
23 blade having a scraping edge held against the surface of the coat-
24 ing roller for selectively scraping off the coating substance
25 therefrom. The scraping edge of the doctor blade has defined
26 therein a series of recesses each having a length ^{substantially} ~~approximately~~
27 equal to the width of each strip, the recesses having a spacing
28 therebetween which is ^{substantially} ~~approximately~~ equal to the spacing between
29 the strips being coated.

30 Preferably, the supply means takes the form of an open

1 top vessel containing the coating liquid, in which the coating
2 roller is partly dipped, so that the coating liquid is applied to
3 the surface of the coating roller throughout its axial length. The
4 doctor blade with its recessed scraping edge operates to scrape off
5 the liquid from those surface portions of the coating roller which
6 do not make contact with the strips. The recesses in the scraping
7 edge leave the coating liquid on the coating roller in the shape of
8 bands which are each of approximately the same width as each strip
9 and which have approximately the same spacing therebetween as that
10 between the strips. Travelling in contact with these bands of the
11 coating liquid, the strips have only their required sides coated
12 with the liquid. There is practically no likelihood of the coating
13 substance intruding onto the other sides of the strips over their
14 longitudinal edges, because only a required amount of the substance
15 is applied to each strip from a required surface portion of the
16 coating roller.

17 The selective doctoring of the coating agent off the
18 coating roller in accordance with the invention offers an addition-
19 al advantage. Should the coating substance be left unscraped from
20 the unrequired surface portions of the coating roller, the sub-
21 stance on these unrequired surface portions would be denatured
22 through overexposure to the atmosphere. The denatured substance
23 would then return to the vessel, thereby accelerating the denatura-
24 tion of the complete substance within the vessel. The present in-
25 vention precludes this danger and extends the useful life of the
26 coating substance.

27 The recesses in the scraping edge of the doctor blade may
28 each be either rectangular or arcuate in shape. Alternatively,
29 the doctor blade edges defining the recesses may be sawtoothed for
30 use with a coating agent of relatively low viscosity. It is also

possible to truncate the sawteeth for use with a coating agent of still lower viscosity. Many doctor blades having recesses of such various shapes and depths may be prepared to regulate the amounts of the liquid to be left on the coating roller and hence to be coated on the strips. Thus the liquid will be applied to the strips in an optimum manner determined in part by its viscosity.

Doctor blades having the recesses of various lengths may also be prepared for coating strips of various widths. Although the coating apparatus of this invention requires the preparation of many interchangeable doctor blades for adaptability to different applications and applications, such doctor blades are far less costly than the interchangeable coating rollers required by the prior art set forth previously.

The above and other features and advantages of this invention and the manner of realizing them will become more apparent, and the invention itself will best be understood, from a study of the following description and appended claims, with reference had to the attached drawings showing some preferable embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a diagrammatic perspective view, partly shown broken away for illustrative convenience, of the coating apparatus constructed in accordance with the novel concepts of this invention;

FIG. 2 is a diagrammatic side elevation of the coating apparatus of FIG. 1;

FIG. 3 is an enlarged axial section through the coating roller in the coating apparatus of FIG. 1, shown together with part

1 of the doctor blade having the recessed scraping edge held against
2 the coating roller;

3 FIG. 4 is an enlarged transverse section, shown partly
4 broken away for illustrative convenience, through one of the fas-
5 tener tapes coated by the apparatus of FIG. 1;

6 FIG. 5 is a view similar to FIG. 3 but showing a modified
7 doctor blade;

8 FIG. 6 is also a view similar to FIG. 3 but showing an-
9 other modified doctor blade;

10 FIG. 7 is also a view similar to FIG. 3 but showing still
11 another modified doctor blade; and

12 FIG. 8 is a fragmentary axial section through a prior art
13 coating roller shown together with fastener tapes being coated.

14 15 DESCRIPTION OF THE PREFERRED EMBODIMENTS

16
17 The coating apparatus of this invention will now be de-
18 scribed in detail as adapted, by way of example only, for simulta-
19 neously coating three surface type fastener tapes. The represent-
20 ative coating apparatus is generally designated 10 in FIGS. 1 and
21 2. As will be seen from these figures, the three fastener tapes F
22 to be coated travel in a predetermined direction, from right to
23 left in FIGS. 1 and 2, along a predetermined path in parallel
24 spaced relation to one another. Extending across the path of the
25 fastener tapes F and spaced from each other in the longitudinal di-
26 rection of the path, two guide rollers 12 and 14 are shown guiding
27 such travel of the fastener tapes. The fastener tapes F have each
28 a known width W and are spaced a predetermined distance S from one
29 another.

30 The coating apparatus 10 includes a coating roller 16

1 disposed horizontally across the predetermined path of the fastener
2 tapes F in coating engagement with the undersides of the fastener
3 tapes. It is understood that the fastener tapes F travel with
4 their front sides directed upwardly, so that the rear sides of
5 these fastener tapes are to be coated in a manner set forth here-
6 after.

7 Any known or suitable coating liquid is to be supplied to
8 the surface of the coating roller 16 throughout its axial dimen-
9 sion. Toward this end the coating roller 16 is shown partly dipped
10 in a coating liquid C contained in a pan or open top vessel 18.
11 Mounted on a rotary shaft 20 extending axially therethrough, the
12 coating roller 16 rotates in a counterclockwise direction as viewed
13 in FIGS. 1 and 2.

14 At 22 in both FIGS. 1 and 2 is shown a doctor blade
15 having a scraping edge 24 held against the surface of the coating
16 roller 16 for selectively scraping off the coating liquid C there-
17 from in accordance with the principles of this invention. FIG. 2
18 indicates that the doctor blade 22 is so angled with respect to a
19 radial direction of the coating roller 16, and in relation to the
20 predetermined rotational direction of the coating roller, as not to
21 scratch or otherwise ruin the surface of the coating roller.

22 As better illustrated on an enlarged scale in FIG. 3, the
23 scraping edge 24 of the doctor blade 22 has defined therein a plu-
24 rality of, three in this particular embodiment, recesses 26 ar-
25 ranged at constant spacings in the longitudinal direction of the
26 scraping edge. Each recess 26 is rectangular in shape in this par-
27 ticular embodiment and has a length (i.e., the dimension in the
28 longitudinal direction of the scraping edge 24) ^{substantially} ~~approximately~~ equal
29 to the width W of each fastener tape F to be coated. The recesses
30 26 are spaced from each other the same distance S as are the fas-

1 tener tapes F. Thus the doctor blade 22 selectively scrapes the
2 coating liquid C off the coating roller 22 only with the relatively
3 protuberant parts 28 of its scraping edge 24 left between the
4 recesses 26.

6 Operation

7
8 Guided by the guide rollers 12 and 14, the fastener tapes
9 F travel at a constant speed in contact with the coating roller 16
10 which is revolving in partial immersion in the liquid C within the
11 open top vessel 18. The doctor blade 22 operates to selectively
12 scrape the liquid C off the successive circumferential parts of the
13 coating roller 16 before such parts come into contact with the fas-
14 tener tapes F. As will be seen from FIG. 3, only the relatively
15 protuberant parts 28 of the scraping edge 24 scrape off the liquid,
16 whereas the recesses 26 in the scraping edge leave the liquid in
17 the form of bands on the coating roller 16. These bands of the
18 coating liquid C left on the coating roller 16 are each of substan-
19 tially the same width as each fastener tape F and are in register
20 with the respective fastener tapes. Thus the fastener tapes F
21 travel in contact with the bands of the coating liquid C left un-
22 scraped on the coating roller 16 and so have their rear sides
23 coated with the liquid.

24 FIG. 4 illustrates the fastener tape F having the coating
25 C' formed on its rear side by the coating apparatus 10 of FIGS. 1
26 and 2. The coating C' is effective to hold the hooks 30 against
27 detachment from the carrier fabric 32. It will be seen that the
28 coating C' covers only the rear side of the fastener tape F, with-
29 out any overflow onto its front side over the selvages 34.

30 As will be seen by referring back to FIG. 3, the thick-

ness of the bands of the coating liquid C left unscraped on the coating roller 16, and therefore of the coatings C' formed on the fastener tapes F, depends upon the depth of the recesses 26 in the scraping edge 24 of the doctor blade 22. Any required number of interchangeable doctor blades may therefore be prepared which have the recesses 26 of varying depths, and these doctor blades may be selectively employed to create the coatings C' of required thickness on fastener tapes.

There may also be prepared a suitable stock of interchangeable doctor blades having the recesses 26 of different lengths. Then the coating apparatus 10 will be readily adaptable for coating fastener tapes or other strips of various widths.

Alternative Forms

The doctor blade for use in the coating apparatus of this invention can be recessed in various ways other than that shown in FIG. 3, in order to adapt the apparatus for use with coating substances of various viscosities and for the specific requirements of each application.

FIG. 5 shows a modified doctor blade 22a having a series of recesses 26a which are arcuate or concave in shape, instead of being rectangular as in the embodiment of FIG. 3. These arcuate recesses 26a result in the creation of convex bands of coating liquid C on the coating roller 16, each band becoming thinner toward its opposite lateral edges. Consequently, when fastener tapes or other strips are held against this coating roller, there is still less possibility of the coating liquid flowing onto their front sides.

In another modified doctor blade 22b shown in FIG. 6,

1 each recess 26b is defined by a sawtoothed edge of the doctor
2 blade. The sawtoothed edge of the doctor blade 22b has a series of
3 pointed sawteeth 36. This doctor blade 22b leaves the coating
4 liquid C in the shape of sawteeth on the coating roller 16. If the
5 liquid is of appropriately low viscosity, it will create a nearly
6 flat coating on one side of a fastener tape or the like without
7 flowing onto the other side thereof.

8 Still another modified doctor blade 22c of FIG. 7 has
9 each of its recesses 26c also defined by a sawtoothed edge. The
10 sawtoothed edge of this doctor blade 22c, however, has a series of
11 truncated sawteeth 36a. As a result, the doctor blade 22c leaves
12 the coating liquid C in the shape of spaced apart sawteeth on the
13 coating roller 16. This doctor blade is therefore suitable for use
14 with a coating liquid of still lower viscosity than that of the
15 liquid used with the doctor blade 22b of FIG. 6.

16 FIG. 8 shows the aforementioned prior art coating roller
17 38 having no recessed doctor blade taught by the present invention.
18 Since the prior art roller 38 has its complete surface covered with
19 the coating agent C as it makes coating contact with the fastener
20 tapes F, the excess amounts of the coating agent have been easy to
21 flow onto the front side of the fastener tapes over their selvages
22 34, resulting in the difficulties pointed out previously. The pre-
23 sent invention eliminates such difficulties by the means set forth
24 in detail hereinbefore.

25 Although it has already been mentioned, it must be borne
26 in mind that the fastener tape coating apparatus herein disclosed
27 has been chosen with the thought of pictorially presenting the
28 principles of the present invention in conjunction with the result-
29 ing advantages gained in this particular application. Thus the il-
30 lustrated apparatus may be modified or altered within the scope of

the invention to conform to design preferences or to the specific requirements of each intended application.

1
2 THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

3 1. A coating apparatus for simultaneously applying a
4 desired coating substance to a plurality of surface type fastener
5 tapes or like strips, each having a known width, traveling in a
6 predetermined direction along a predetermined path in parallel re-
7 lation to each other and with a predetermined spacing therebetween,
8 the coating apparatus comprising:

9 (a) a coating roller disposed across the predetermined
10 path of the strips to be coated so as to be in coat-
11 ing contact therewith;

12 (b) supply means for supplying the coating substance over
13 the complete surface of the coating roller; and

14 (c) a doctor blade having a scraping edge held against
15 the surface of the coating roller for selectively
16 scraping off the coating substance therefrom, the
17 scraping edge of the doctor blade having defined
18 therein a plurality of recesses each having a length
19 ^{substantially}~~approximately~~ equal to the width of each strip, the
20 recesses having a spacing therebetween which is ~~ap-~~
21 ^{substantially}~~proximately~~ equal to the spacing between the strips;

22 (d) whereby the doctor blade is effective to scrape off
23 the coating substance only from those portions of
24 the surface of the coating roller which do not make
25 coating contact with the strips.

26
27 2. A coating apparatus as defined in claim 1, wherein
28 each recess in the scraping edge of the doctor blade is rectangular
29 in shape.

1 3. A coating apparatus as defined in claim 1, wherein
2 each recess in the scraping edge of the doctor blade is arcuate in
3 shape.
4

5 4. A coating apparatus as defined in claim 1, wherein
6 the doctor blade has a sawtoothed edge defining each recess.
7

8 5. A coating apparatus as defined in claim 4, wherein
9 each sawtoothed edge of the doctor blade has a series of pointed
10 sawteeth.
11

12 6. A coating apparatus as defined in claim 4, wherein
13 each sawtoothed edge of the doctor blade has a series of truncated
14 sawteeth.
15

16 7. A coating apparatus as defined in claim 1, wherein
17 the supply means comprises an open top vessel for accommodating the
18 coating substance the coating roller being partly immersed in the
19 coating substance in the vessel.
20

21 Dated this 31st day of October 1986.

22 YOSHIDA KOGYO K.K.

23 Patent Attorneys for the Applicant
24 F.B. RICE & CO.
25
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30

FIG. 1



FIG. 2

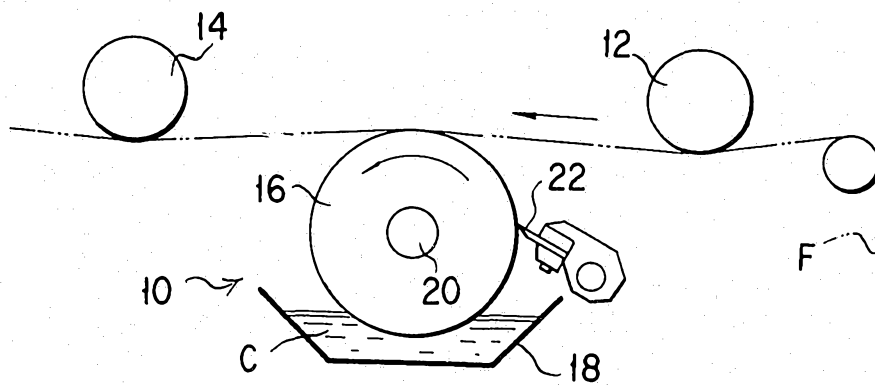


FIG. 3

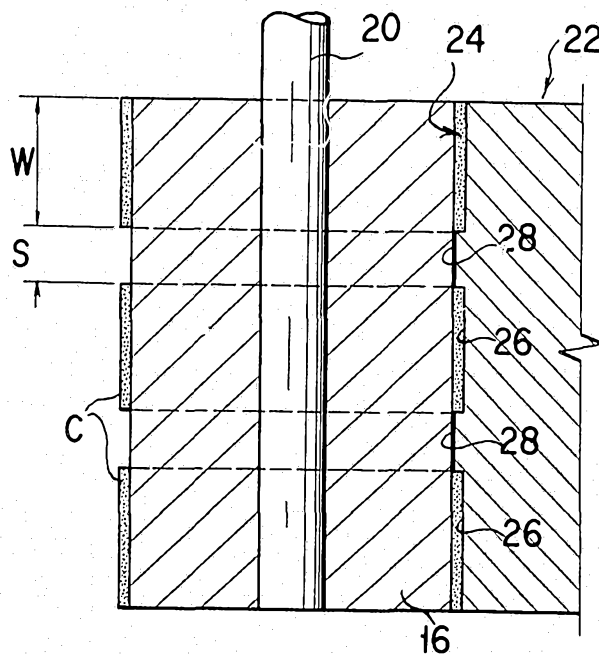


FIG. 4

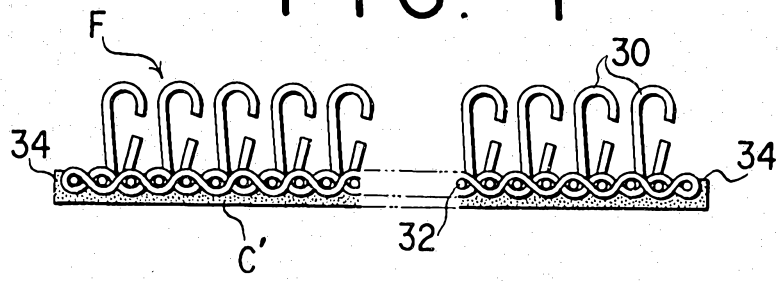


FIG. 5

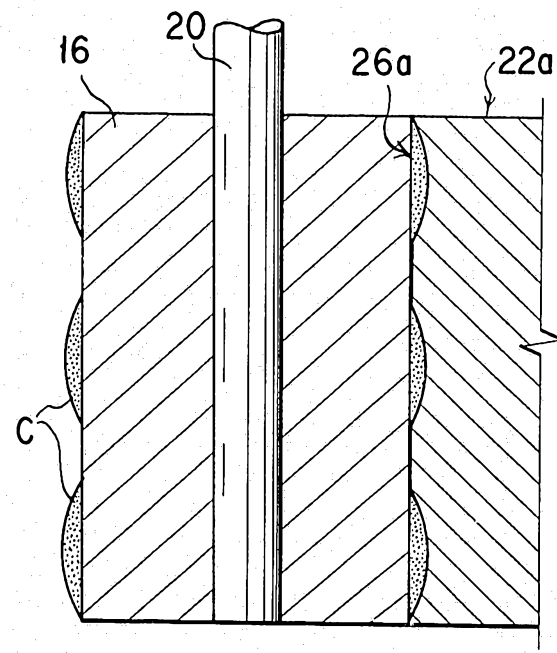


FIG. 6

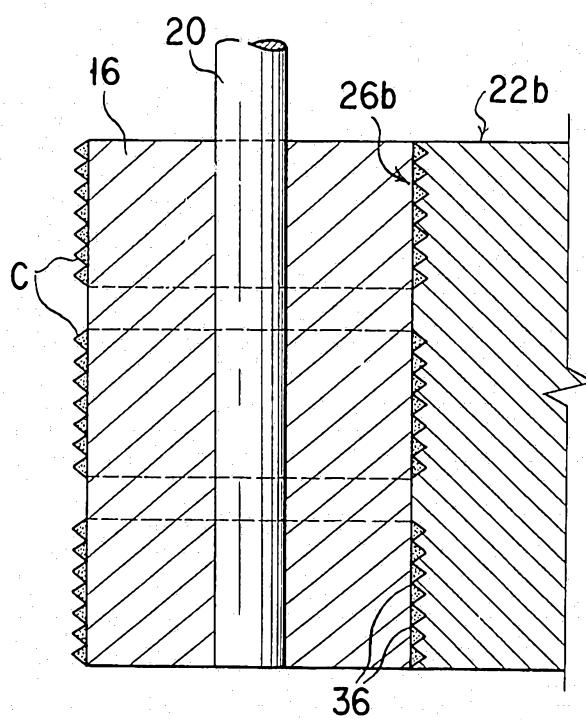


FIG. 7

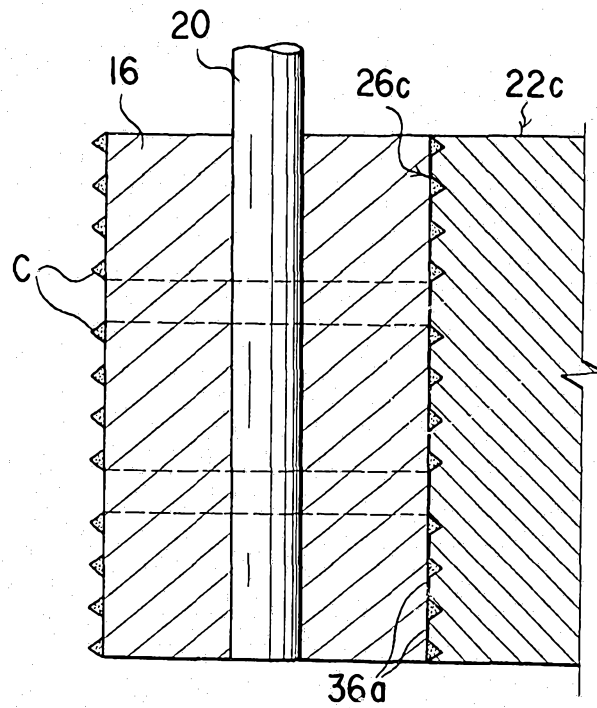


FIG. 8

PRIOR ART

