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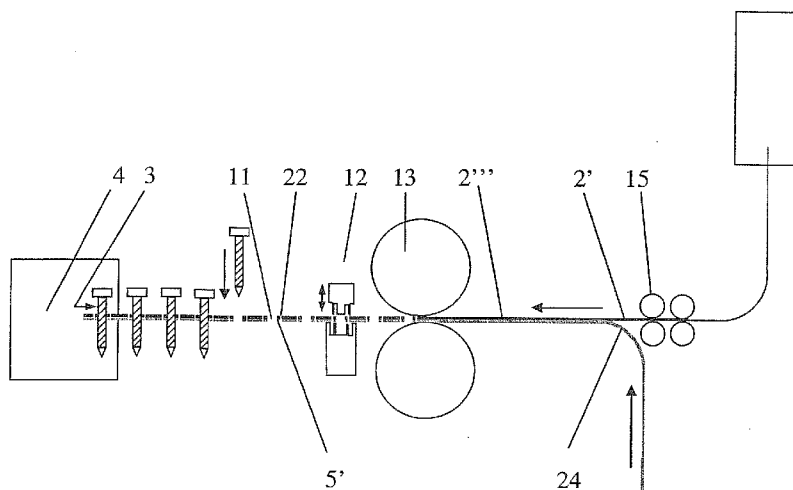


FIG. 5

(57) Abstract: Method for production of painted screws or nails in a magazine strip Method for production of painted driving-in elements (8), the method comprising- providing the elements (8) with heads (7) for driving the elements into a medium, - providing a strip-shaped magazine (2) with holes (1) for ordered supply of the elements to a driving-in power tool, - inserting the elements into the holes, and subsequently - painting the heads of the elements while located in the holes.

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Method for production of painted screws or nails in a magazine strip

Field of the Invention

The present invention relates to method for production of painted screws arranged in holes in an elongated strip magazine for driving-in power tools. The invention also
5 relates to a such a magazine.

Background of the Invention

For rapid fastening by screws, it is common to use belts with screws extending through holes in the belt. An appropriate tool transports the belt though a screwing
10 head which drives the screws one by one through the belt and into the underlying medium, for example a wall. Such belt systems are disclosed in US patent No. 6,832,696 by Donner or US patent No. 7,090,077 by Pally et al. Likewise, belts exist for nails, for example as disclosed in US patent No. 3,904,032 by Maier. Such belts are typically made of plastics, however, metal belts have been considered in European patent
15 application EP1241363A1 by Sieber.

If screws in such belts are provided with washers, these are typically provided on the opposite side of the belt relative to the screw head, as disclosed in US patent No. 6,811,366 by Chen. Alternatively, washers may be integral parts of the belt and re-
20 leased from the belt together with the screw, for example as disclosed in US patent No. 3,904,032 by Maier, US patent No. 4,019631 by Lejdegaard, US patent No. 6,036,013 by Chen, US patent No. 6,620,011 by Obermeier. Likewise, disclosed in US patent No. 3.955,674 by Maier are nails in belts with integrated washers.

25 During production, screws are pressed into the belts either manually or by machines. Machine treatment of the screws is fastest, however, when screws are painted, for example powder painted, the machine treatment may damage part of the paint on the screw head or washer, which results in an inferior product. It would be desirable to solve this problem.

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Object of the Invention

It is the object of the invention to provide a production method minimizing the risk for damaging the paint on screws or nails during production and insertion into belts.

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Description of the Invention

This object is achieved with a method for production of painted screws or nails, wherein the method comprises

- providing driving-in elements with heads for driving the elements into a medium,
- 10 - providing a magazine with holes, for example a flat, elongated strip magazine having holes arranged equally spaced in a row along a longitudinal axis of the strip magazine for stepwise supply of the elements in a magazine receptacle of a driving-in power tool,
- inserting the elements into and through the holes, and subsequently
- 15 - painting the heads of the elements while located in the holes.

In contrast to prior art, the driving-in elements, typically screws or nails, are painted after insertion into the strip magazine. The advantage is the fact that the elements are subjected to the roughest handling, namely the insertion, prior to the painting. This handling implies less damage to the paint on the surface of the elements. In addition, the insertion into the strip magazine has the advantage that the transport system of the elements into and through the painting machine can be provided by simple means, because the driving-in elements are already ordered in the magazine itself, which is easy to handle by the machine. Whereas prior art machines have to pick up screws or nails one by one for the painting, this is facilitated by the invention, because not the driving-in elements have to be picked up, but the strip only has to be guided through the painting machine.

In some cases, it is desired to use powder painting at a temperature above 180°C. In this case, the strip magazine is made of an electrically conducting material resistant to this temperature. Preferably, the material is a metal, for example aluminium or steel, although other materials are possible, for example carbon materials or conducting, thermo-resistant polymers.

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Some screws are inserted into the magazine strip without washers, whereas others are provided with washers. If the washers are provided between the head and the strip magazine, it is advantageous to provide a distance of more than 1 mm, for example
5 equal to or more than 2, 3, 4, or 5 mm, between the washer and the head for allowing paint to enter the space between the head and the washer.

Alternatively, the washers may be provided as integral portions of the strip magazine. In this case, typically, the washers are connected to a remaining part of the strip magazine by separable connecting ribs, for example following principles as described in
10 prior art documents, for example as disclosed in US patent No. 3,904,032 by Maier, US patent No. 4,019,631 by Lejdegaard, US patent No. 6,036,013 by Chen, US patent No. 6,620,011 by Obermeier, and US patent No. 3,955,674 by Maier. If the head and the washer are subject to painting, it is advantageous to provide a distance of more
15 than 1 mm, for example equal to or more than 2, 3, 4, or 5 mm, between the washer and the head for allowing paint to enter the space between the head and the washer.

In a concrete embodiment, the method comprises

- providing a strip, for example a metal strip, with a flat mid-piece, for example with a
20 substantially endless flat mid-piece,
- stamp punching or calendar punching holes for driving-in elements into the mid-piece
- subsequently inserting the driving-in elements into the holes,
- and then painting the heads of the driving-in elements while located in the strip.

25 In order to increase the stability of the strip magazine, there may be provided edge parts along the strip extending from the mid-piece, for example extending laterally. The edge parts may extend at right angles from the mid-piece, but this is not necessary, as the edge parts may extend under a sharp angle between the edge parts and the
30 mid-piece. For example, the edge parts may have an angle of between 70 and 110 degrees with the mid-piece in order to stabilize the strip magazine.

One possible solution is an aluminium strip, preferably extruded. Laterally extending edges may be provided as part of the extrusion process. For example, the edge parts

may have an L-form, which means that they extend perpendicular in one direction from the mid-piece. An example of this cross sectional shape is disclosed in International patent application WO 93/09918. Another example is edge parts having a T-form, which means that they extend perpendicular in two directions from the mid-piece. An example of this cross sectional shape is given in German Utility Model DE 200 02 058.

If the edge parts are not provided by extrusion, there are other possibilities, among which calendar rolling of the strip is one option.

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If the strip magazine is provided with laterally extending edge parts, these edge parts may be provided with V-shaped slots much in the way as illustrated in International patent application WO 93/09918 in order to allow bending of the strip magazine despite the lateral edge parts. The slots, if equidistant longitudinally along the magazine, are also useful for precise advancing of the magazine through the power tool. In addition, there may be provided weakening lines from one slot on one edge part to a slot on the opposite edge part such that these weakening lines traverse the mid-piece perpendicular to a longitudinal axis of the strip magazine. For example, such weakening lines can be provided by thinning the material along the lines by calendar rolling.

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It is known to provide washers with a metal surface facing the head and with a polymer, typically a rubber polymer, underneath the metal surface. In order to provide such washers, the method includes providing the strip magazine as a metal strip with attached polymer covering one side of the strip and providing the washers as integral parts of the strip magazine. The elements are then inserted into the holes of the strip magazine from the metal side.

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A preferred magazine comprises a strip in a first material having a flat mid-piece and edge parts extending laterally on both sides of the mid-piece. The mid-piece has cut-out perforations surrounding a portion of the magazine strip to form a washer. The washer is connected to a remaining part of the magazine strip by breakable ribs between the perforations. One of two surfaces of the strip is covered by a polymer, the polymer being substantially softer than the first material.

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For example, the method comprises attaching a polymer material to one side of the strip before punching holes into the mid-piece. In addition, perforations are punched into the mid piece and through the polymer layer, the perforations surrounding a portion of the magazine strip to form a washer, where the washer is connected to a remaining part of the magazine strip by breakable ribs between the perforations.

A preferred polymer is rubber, especially ethylene propylene diene M-class (EPDM) rubber, which is also resistant to temperatures above 160°C, preferably between 160°C and 200°C or between 180°C and 200°C or between 200°C and 220°C, which is the normally used temperature range for powder painting.

By providing a magazine strip with an upper material which is a hard material, for example metal or carbon fibre material, and a lower material, which is a soft material, like rubber, the punching process for the holes and the perforations around the washer is easier than if the strip material were entirely soft, because substantial deformation or even collapsing of the strip during the process is prevented. Thus, the advantages of a soft damping or tightening material of the washer, such as rubber or polymer foam, can be combined with the advantage of a hard and durable washer surface against which the screw is driven.

Description of the Drawing

The invention will be explained in greater detail with reference to the drawing, where FIG. 1 illustrates a system for production of a strip magazine, FIG. 2 illustrates an embodiment of a strip magazine for screws without washers, FIG. 3 illustrates an embodiment of a strip magazine for screws with washers, FIG. 4 illustrates an embodiment of a strip magazine for screws with washers integrated in the magazine, FIG. 5 illustrates a further system for production of a strip magazine, FIG. 6 illustrates a strip magazine with edge parts having local deformations supporting a polymer band,

FIG. 7 illustrates a further strip magazine with edge parts having local deformations supporting a polymer band,

FIG. 8 illustrates a magazine with straight edge parts bent towards the cavity supporting a polymer band,

5 FIG. 9 illustrates a magazine with L-formed edge parts supporting a polymer band,

FIG. 10 illustrates a magazine with rounded edge parts bent towards the cavity supporting a polymer band,

Detailed Description of the Invention

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FIG. 1 illustrates a system 1 for production of the magazine strip 2 according to the invention. The system 1 comprises a substantially endless strip 2 which is running 10 through the different machines 15, 13, 12, 4. The strip 2 is provided with holes 11 into which screws 8, or alternatively nails or bolts, are inserted. The screw 8 has a head 7 and a threaded shaft 9. Between the head 7 and the strip 2, there may optionally be provided a washer 5 with a hole 6 for accommodating the screw shaft 9. The washer 5 15 may, alternatively, be provided on the opposite side 17 of the strip 2, however, for painting it advantageously provided above the strip 2 as illustrated.

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The screws 8 are inserted 10 into the corresponding holes 11 in the strip 2 prior to painting in a painting station 4. In order that the paint, for example powder paint, also reaches the surface of the washer 5, the screw head 7 is located at a distance 3 from the washer, for example with a distance 3 of more than or equal to 1, 2, 3, 4, or 5 mm between the lower edge of the screw head 7 and the upper edge of the washer 5 as 25 indicated in FIG. 1.

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After having traversed the painting station 4, the substantially endless strip may be cut into shorter pieces, for example pieces of 30 or 50 cm. The term “endless” strip does not actually mean that the strip is endless but is a jargon in the field for strips that are very long, for example more than 10 meters.

The holes in the strip 2 are provided by corresponding machines. For example a stamp punch machine 12 may be used or a calendar punch machine 13 or a combination of both. A strip 2', 2'' without holes may be provided from a strip source 16, for exam-

ple an extruder or a magazine of rolled up metal bands. If the initial strip is provided from a magazine of flat rolled up metal bands, the flat band 2'' may be formed into a strip 2' with laterally extending side edges by using appropriate machines, for example metal rolling machines 15.

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An example of a part of a magazine strip 2 is illustrated in FIG. 2. For sake of illustration, the magazine strip 2 on FIG. 2 is shorter than it will usually be. The magazine strip 2 has a mid-piece 21 and edge parts 18 extending laterally from the mid-piece. The edges 18 stiffen the strip 2. A number of radial slits 19, for example four as shown, extend from the holes 11' and part the area surrounding the hole 11' into four deformable flaps 20. When the screw 8 is screwed into a medium, it will drive through the hole 11' pressing the flaps 20 apart and freeing the screw 8 from the strip 2. The arrangement of slits 19 and flaps 20 has similarities with the prior art system disclosed in EP 1 241 363.

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A magazine strip 2 with slits 19 and flaps 20 may also be used for screws 8 with washers 5 as illustrated in FIG. 3. The slits 19 for the flaps 20 may also be provided with the punching machine 12 or 13 or with another punching machine.

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Whereas the strip 2 in FIG. 2 has a good stability against bending, it may more be desirable, to have a strip which can follow bending trajectories through the screwing head or nailing head of a driving-in power tool. For this sake, the magazine strip may be provided with slots 28, for example V-shaped slots as illustrated in FIG. 3, although other slot forms are possible. The lateral edges may then be used for guiding a strip in a driving-in power tool, for example as illustrated in German Utility Model DE 200 02 058 or in International Patent Application WO 93/09918. The slots 28 can be used, in addition, for a safe and precise advancing of the strip 2 in a machine. The lateral edges 18 are also useful in a punching machine 12, 13, because the lateral edges 18 may be held in a corresponding guide rail in the punching machine 12, 13 and prevent deformation or even collapsing of the strip 2 during punching. For this sake, a metal rolling machine 15 for forming the lateral edges 18 is preferred rather upstream than downstream of the punching machine 12, 13, as also illustrated in FIG.

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An alternative magazine strip 2 is illustrated in FIG. 4. In this embodiment, washers 5' are provided as integral portions of the magazine strip 2. The washers are provided through perforations/cut-outs 22 in the form of circular arcs, for example obtained by punching as described above. The washers 5' are connected by ribs 23 to the remaining part 25 of the magazine strip 2. The ribs 23 act as break points when the screw 8 is driven through the magazine strip 2 such that the washer 5' is detached from the remaining part 25 of the strip 2 and follows the screw 8.

As illustrated in FIG. 4, the magazine strip 2 may, optionally, be provided with a polymer layer 24 on the opposite side of the magazine strip 2 relatively to the side facing the screw head 7. The perforations 22 extend also through the polymer layer 24 such that the entire washer 5' is released from the remaining part 25 of the magazine strip 2, the entire washer comprising a first layer of a stiff material, for example metal, and polymer layer 24.

FIG. 5 illustrates production of a magazine strip 2 as illustrated in FIG. 4. The system is much like the system of FIG. 1, and only differences will be explained in detail. The substantially endless strip 2' is joined with a polymer, for example by providing a polymer band 24 that is glued, vulcanized or melted onto the lower surface of the strip 2', or the polymer is provided as a melt onto the surface. The combined strip 2'' is punched in a machine 12 and/or 13 to provide holes 11 and perforations 22 to form a washer 5'. Screws 8 are inserted into the holes 11 of the washer 5' for painting in the painting station 4. In order that the washer 5' also receives paint, there is provided a distance 3 between the washer 5' and the screw head 7.

Alternatively, a polymer band 24 may be joint with the strip 2', before the strip 2' is exposed to an edge deformation in a metal rolling machine 15. For example, the rolling machine 15 causes a deformation of a flat sheet into a substantially U-formed or C-formed magazine 2 having laterally extending side edge parts 18. Such a magazine strip 2 is illustrated in FIG. 4 and FIG. 6.

In FIG. 6, the magazine strip 2 is also provided with a plurality of local deformations 26 of the edge parts 18, the local deformations 26 being in the form of indentations.

The plurality of local deformations 26 towards the concavity 27 of the U-formed magazine strip 2 prevents the polymer band 24 from leaving the magazine strip 2 even in the case that the polymer band 24 is not glued or vulcanized onto the strip 2. Thus, the polymer band 24 is held by the strip 2 due to the local deformations 26.

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Once, the screws are inserted into the strip 2, the friction between the polymer part of the washers 5' and the screw shaft 8 secures the polymer band additionally to the screws. For example, the friction between the washers 5' and the screw shaft 8 may be provided with protrusions that extend radially inward from the washers towards the screw shaft as disclosed in US patent No. 6,036,013 by Chen.

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In the case that local deformations 26 are used to hold the polymer band 24 against the strip 2, the band may be bent into the U-form as well, for example through the metal rolling process, or may be provided in U-form, as illustrated in FIG. 6. Alternatively, the polymer band may be provided in a flat form, as illustrated in FIG. 7. In this case, the polymer band is not vulcanised onto the strip 2 but held in place due to the local deformations 26 of the lateral edges 18.

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Optionally, the polymer band 24 may – in addition to the local deformations 26 - be glued onto the strip in order to prevent deformation of the polymer band when screws are inserted into the holes 11. Using glue instead of vulcanisation simplifies the production process substantially. Also, the glue need not cover the entire contact area between the strip and the polymer band. For example, it suffices to support the polymer band, on the one hand, by the local deformations 26 at the edges 18 and, on the other hand, by a one or more lines of glue along the strip 2 near the washers 5' and/or at the position of the washers 5'.

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As an alternative to the local deformations, the polymer band 24 may also be held in place, if the edges 18' are bent an angle V of more than 90 degrees, for example, as illustrated in FIG. 8. Thus, the edge parts 18' form a sharp angle W with the mid-piece 21, and the edge parts 18' have edges 31 that are distanced d apart, which is smaller than the width D of the mid-piece 21. Also, in this embodiment, vulcanisation may be

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avoided and, optionally, glue may be used. The edges 18' may also comprise slots 28, as illustrated in FIG. 3, if a bending of the magazine strip is desired.

5 A further alternative is shown in FIG. 9. In this case, the strip 2 comprises edges 18'' that are bent into an L-form on either side of a flat midpiece 21 in order to hold the polymer band 24. Also in this embodiment, vulcanisation may be avoided and, optionally, glue may be used. The edges 18'' may also comprise slots 28, as illustrated in FIG. 3, if a bending of the magazine strip is desired.

10 A further alternative is shown in FIG. 10. In this case, the strip 2 comprises curved edge parts 29 on either side of a flat mid-piece 21 forming hollows 32 in which the edges of the polymer band 24 are accommodated. Also, in this embodiment, vulcanisation may be avoided and, optionally, glue may be used. The edges 29 may also comprise slots 28, as illustrated in FIG. 3, if a bending of the magazine strip is desired.

15 Alternatively, the strip 2 may comprise holes 30 in the bent edges 29 as illustrated in FIG. 9. These holes 30 are provided mutually equidistant for cooperation with corresponding transport means in the power tool such that a safe and precise transport is achieved. If holes 39 are provided and no slots 28, the strip is stiff and can not be rolled onto a roll. Thus, the magazine strip would normally be provided at a suitable

20 length shorter than bendable strips, for example at a length of 20 cm to 50 cm, typically 25-30 cm.

Composite washers are commercially available, where a polymer ring, typically HDPM rubber, is vulcanized onto a metal ring. The above embodiments provide the

25 washers 5' as integrated parts of the strips 2. After driving-in the screws or nails into the underlying material causing removal of the washers 5' from the strip, the remaining part 25 of the strip 2 is normally discarded. In this connection, it is pointed out that the rubber is a relatively expensive material. In order to reduce the amount of rubber in the cavity 27 of the strip 2, the polymer band need not to extend to the edges

30 18, 29 of the strip 2 along its entire length. For example, it suffices to provide a band that only covers portions with the washers (5'). This band could be a band with straight edges such that it has a constant width along its length. However, it may alternatively have a corrugated form, being narrower in the regions between the washers

and wider at the locations of the washers. Optionally, at the location of the washers 5', it may extend to the edges 18, 29 for being hold by these, especially, if no glue is used to fix the polymer band 24 to the mid-piece 21.

- 5 Though the illustrated magazines only show three holes for driving-in elements, it is to be understood that the number of screws can take any arbitrary value. Typically, the magazines will have more than three holes for screws.

CLAIMS

1. Method for production of painted driving-in elements (8), the method comprising
- providing the elements (8) with heads (7) for driving the elements (8) into a medium,
 - 5 - providing an elongated strip-shaped magazine (2) with holes (11) for stepwise supply of the elements (8) to a magazine receptacle of a driving-in power tool,
 - inserting the elements (8) into the holes (11), and subsequently
 - painting the heads (7) of the elements (8) while the elements (8) are located in the holes (11).
- 10
2. Method according to claim 1, wherein the method comprises powder painting at a temperature above 180°C, and wherein the magazine (2) is made of an electrically conducting material resistant to this temperature.
- 15
3. Method according to claim 1 or 2, wherein the method comprises including a washer (5) between the head (7) and the magazine (2) and providing a distance of more than 1 mm between the washer and the head for allowing paint to enter the space between the head and the washer.
- 20
4. Method according to claim 1 or 2, wherein the method comprises providing washers (5') for the elements (8) as integral portions of the magazine (2), the washers (5') being connected to a remaining part (21) of the magazine (2) by separable connecting ribs (23), and wherein the method comprises inserting elements (8) into the holes (11) with a distance of more than 1 mm between the washer (5') and the head (7) for allowing paint to enter the space (4) between the head (7) and the washer (5').
- 25
5. Method according to claim 4, wherein the method includes providing the magazine (2) as a metal strip with attached polymer (24) covering one side of the strip, and wherein the method comprises inserting elements (8) into the holes (11) of the magazine (2) from the metal side.
- 30
6. Method according to any preceding claim, wherein the method comprises,
- providing a metal strip with a substantially endless flat mid-piece (21)

- providing edge parts (18, 29) longitudinally along the strip, the edge parts (18, 29) extending from the mid-piece (21) so as to form a cavity (27) with the mid-piece (21),
- punching holes (11) for driving-in elements (8) into the mid-piece (21),
- subsequently inserting the driving-in elements (8) into the holes (11),
- 5 - and then painting the heads (7) of the driving-in elements (8) while located in the holes (11).

7. A method according to claim 6, wherein the providing of the metal strip comprises extruding an aluminium strip.

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8. A method according to claim 6 or 7, wherein the method comprises calendar rolling the strip for forming the edge parts (18, 29) as part of a metal rolling process.

9. A method according to any one of the claims 6-8, wherein the method comprises attaching a polymer material (24) to one side of the strip before punching holes into the mid-piece (21), and wherein the method comprises punching perforations (22) into the mid piece, the perforations extending through the strip and the polymer material and surrounding a portion of the magazine (2) to form a washer (5'), the washer being connected to a remaining part (25) of the magazine by breakable ribs (23) between the perforations (22).

20

10. A magazine for a method according to any preceding claim, wherein the magazine (2) comprises a strip provided in a first material, the strip having a flat mid-piece (21) and edge parts (18, 29) longitudinally along the strip, the edge parts (18, 29) extending from the mid-piece so as to form an elongate cavity (27) with the mid-piece (21), wherein the cavity comprises a polymer (24), the polymer being substantially softer than the first material, the mid-piece (21) having perforations (22) extending through first material of the mid-piece (21) and through the polymer in the cavity and surrounding a portion of the mid piece and the polymer to form a washer (5, 5'), the washer being connected to a remaining part (25) of the magazine strip (2) by breakable ribs (23) between the perforations (22).

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11. A magazine according to any preceding claim, wherein the magazine strip (2) is resistant to temperatures above 180°C.

12. A magazine according to claim 10 or 11, wherein the polymer is provided as a polymer band (24) connected to the midpiece (21) material by gluing or vulcanization at least in an area comprising the portion in order to form a composite washer (5').

13. A magazine according to claim 12, wherein the polymer (24) and the midpiece (21) material are connected by gluing without vulcanisation.

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14. A magazine according to any one of the claims 10-13, wherein the edge parts (18) extend laterally from the mid-piece (21).

15. A magazine according to claim 14, wherein the polymer is provided as a polymer band (24) and wherein the edge parts (18'') have an L-shape to form a C-shaped cavity, the L-shaped edge parts supporting the polymer band in the cavity.

16. A magazine according to claim 14, wherein the polymer is provided as a polymer band (24) and wherein the edge parts (18') have a plurality of local deformations (26) along the edge part (18') and towards the cavity (27), the deformations (26) supporting the polymer band (24) in the cavity.

17. A magazine according to any one of the claims 10-13, wherein the polymer is provided as a polymer band (24) and wherein the edge parts (18') extend from the mid-piece (21) cavity under a sharp angle (W) with edges (31) of the edge parts (18') having a mutual distance (d) smaller than the width (D) of the mid-piece (21).

18. A magazine according to any one of the claims 10-13, wherein the polymer is provided as a polymer band (24) and wherein the edge parts (29) are curved to form hollows (32) accommodating and supporting part of the polymer band in the cavity (27).

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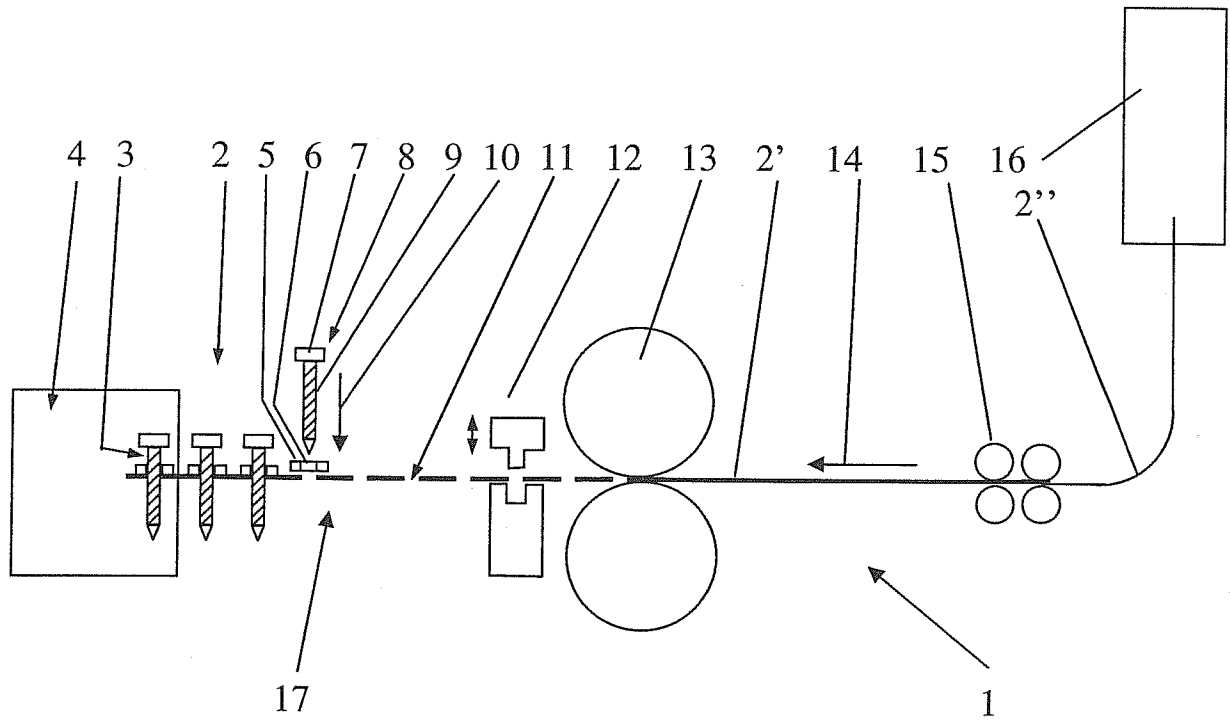


FIG. 1

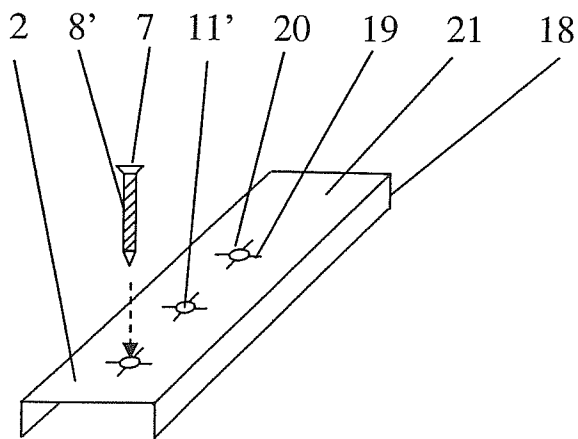


FIG. 2

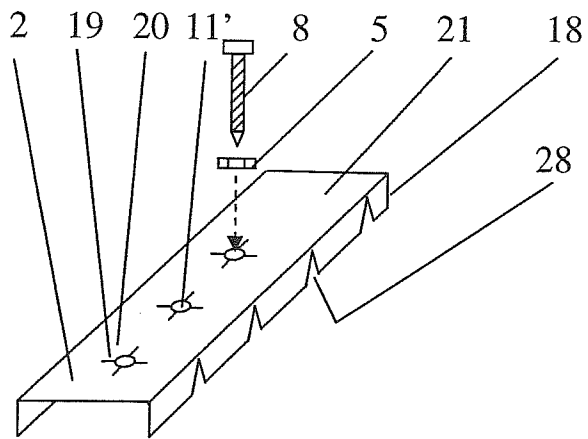


FIG. 3

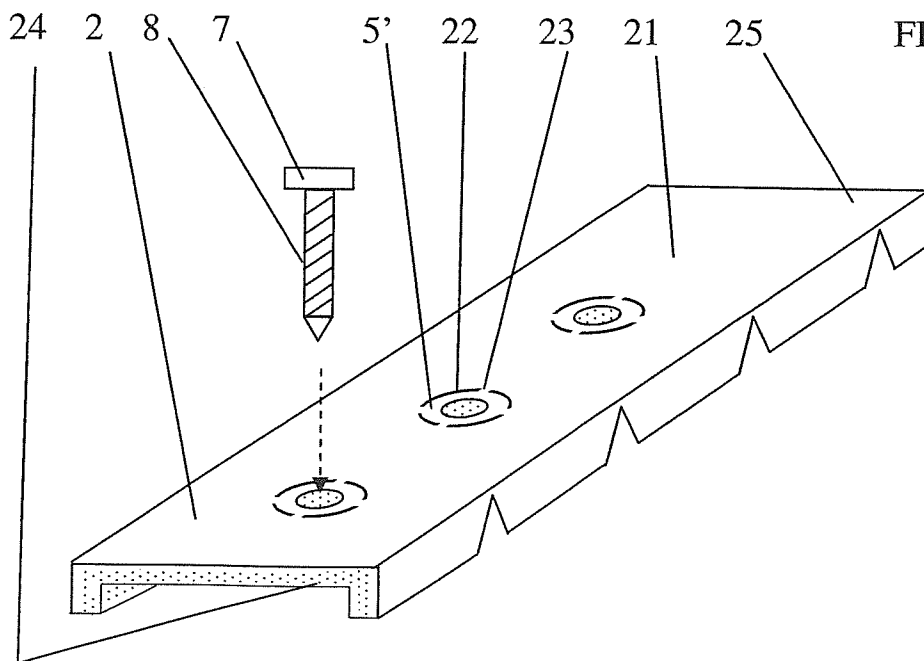


FIG. 4

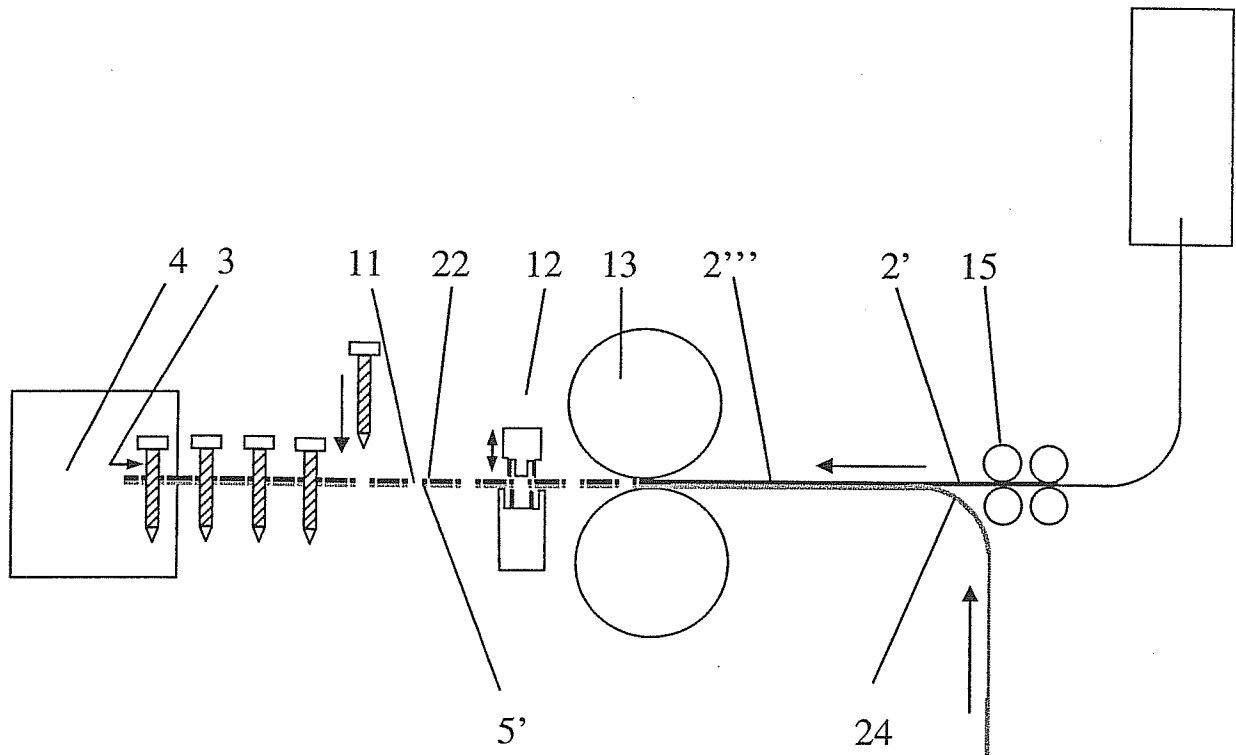
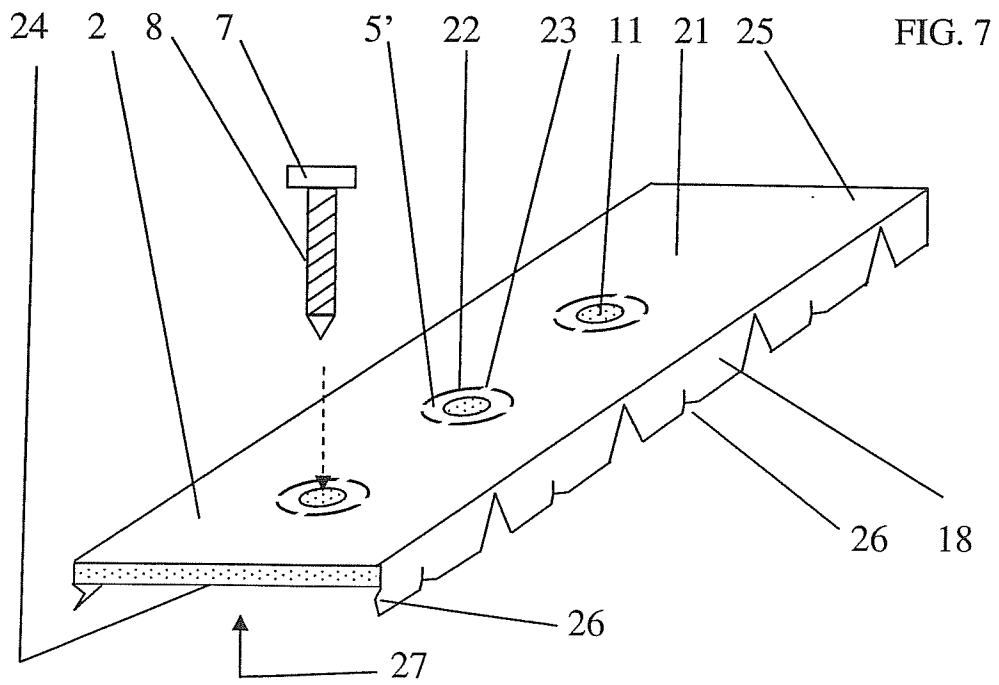
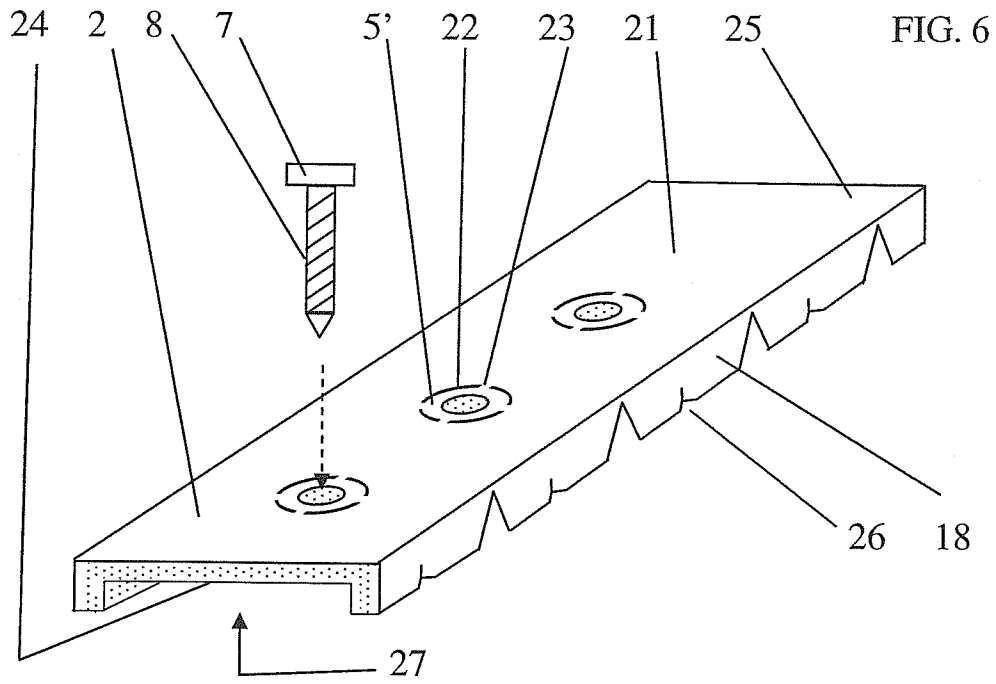
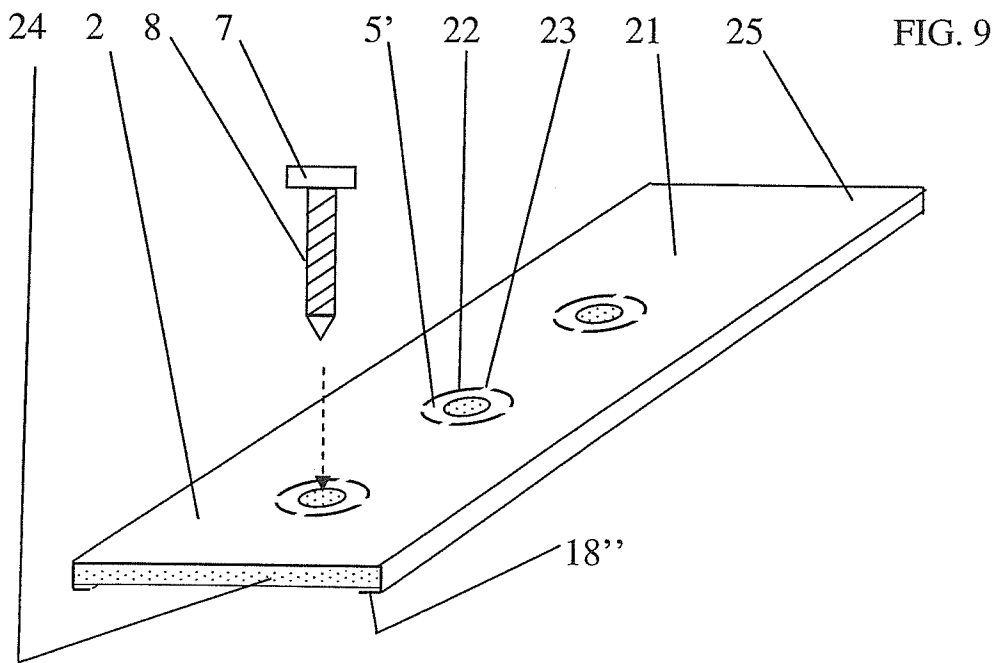
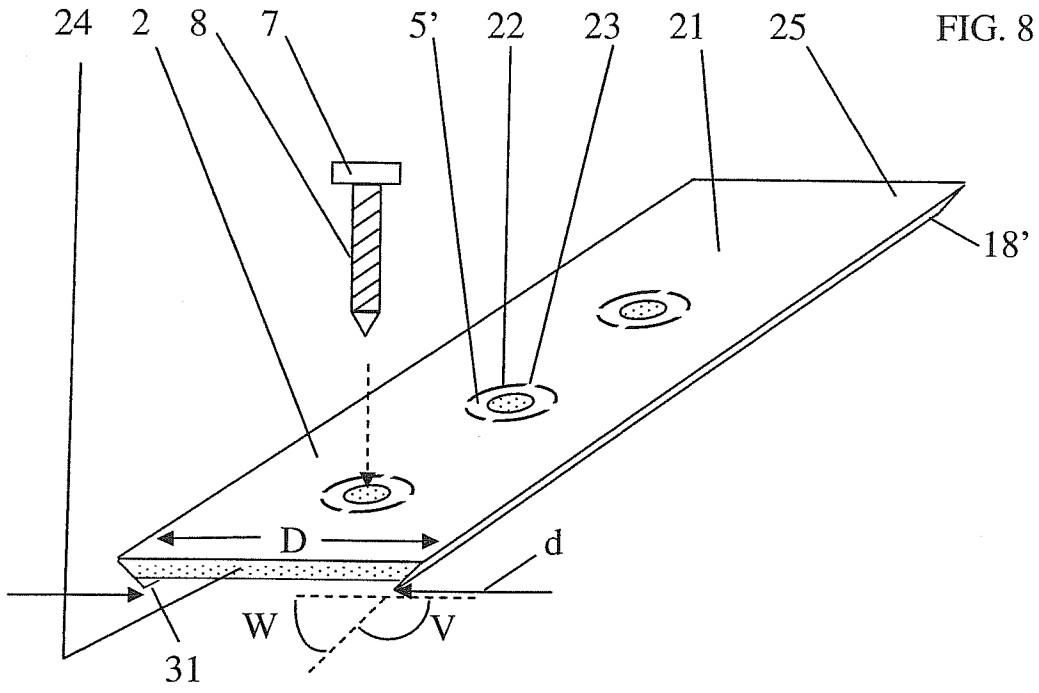
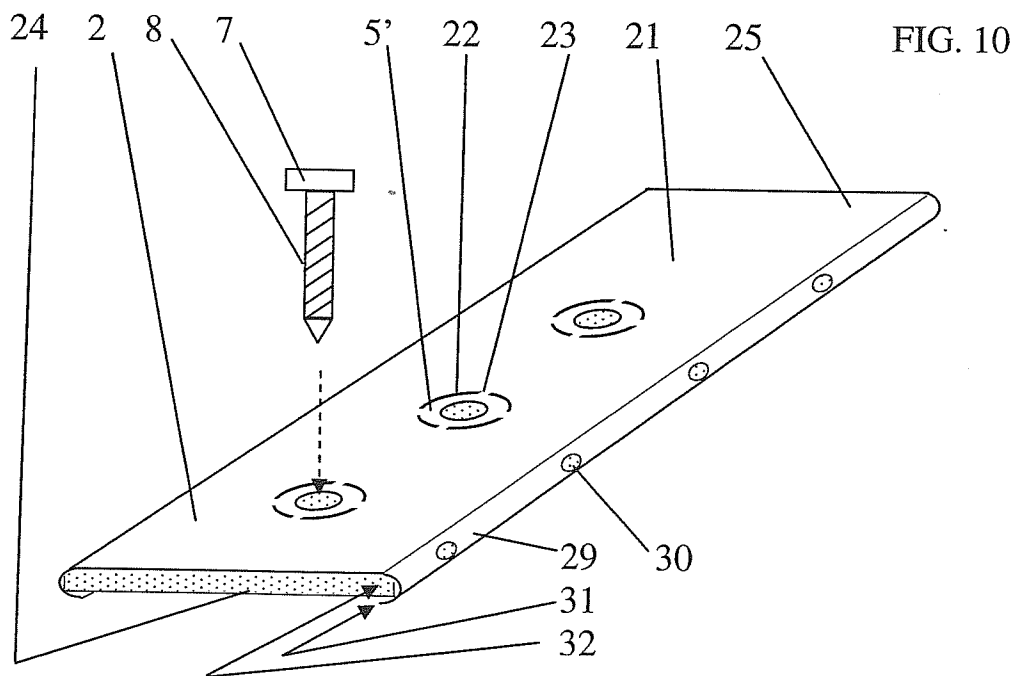


FIG. 5







INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2009/050324

A. CLASSIFICATION OF SUBJECT MATTER
 INV. B05C13/02 F16B15/08 F16B27/00
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
B05C F16B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1 493 930 A2 (ILLINOIS TOOL WORKS [US]) 5 January 2005 (2005-01-05) paragraphs [0015], [0021]	1
Y	GB 742 851 A (BRITISH ERMETO CORP LTD; SIDNEY HERBERT JONES) 4 January 1956 (1956-01-04) page 2, lines 25-60	1
Y	US 2008/260496 A1 (PARMANN JASON B [US]) 23 October 2008 (2008-10-23) paragraphs [0023], [0024]	1
A	AT 382 697 B (SFS STADLER AG [CH]) 25 March 1987 (1987-03-25) the whole document	10-18

Further documents are listed in the continuation of Box C. See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier document but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 9 April 2010	Date of mailing of the international search report 16/04/2010
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040. Fax: (+31-70) 340-3016	Authorized officer Rochus, Johann
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INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2009/050324

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9

The subject-matter of claim 1 relates to a method for painting the heads of driving-in elements, comprising the steps of arranging them in holes of a strip-shaped magazine and subsequently painting the heads of the elements

2. claims: 10-18

Claim 10 refers to a magazine comprising an elongated strip of a first material having a flat mid-piece and edge parts extending longitudinally along the strip and forming a cavity with the mid-part, a polymer of substantially softer material than the first material being arranged in the cavity, the mid-piece having perforations extending through the polymer to form a washer which is connected to the remaining part of the mid-piece by breakable ribs

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/DK2009/050324

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
EP 1493930	A2	05-01-2005	AU 2004202631 A1	13-01-2005
			CA 2466852 A1	30-12-2004
			EP 1953396 A2	06-08-2008
			KR 20050005776 A	14-01-2005
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			NZ 533646 A	27-01-2006
			US 2008273943 A1	06-11-2008
			US 2004265092 A1	30-12-2004
			US 2007264434 A1	15-11-2007

GB 742851	A	04-01-1956	NONE	

US 2008260496	A1	23-10-2008	NONE	

AT 382697	B	25-03-1987	NONE	
