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(54) **Knitting machine for manufacturing plush fabrics**

Strickmaschine zur Herstellung von Plüschware

Métier à tricoter pour la production des tricots bouclette

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a circular knitting machine and particularly to a knitting machine for manufacturing plush fabrics with a longer plush.

BACKGROUND OF THE INVENTION

[0002] Plush fabrics are generally produced by knitting machines, also called artificial wool knitting machines. The techniques of using circular knitting machines to produce plush fabrics are known in the art. For instance, U.S. patent No. 6,735,987 has latch needles located in a cylinder and a plurality of sinkers located horizontally on a needle dial that interact with each other to hold a plush thread on the front edge of the sinkers to form a longer loop.

[0003] U.S. patent Nos. 6,128,930, 6,094,944 and 5,463,882 basically include latch-less cylinder needles located in a cylinder, latch needles located on a needle dial and a cutting unit that interact to produce plush fabrics. The loop is formed on the hook of the latch-less cylinder needle, and is severed by two sinkers that have a blade on the front side and slide on two sides of the cylinder needle to form the plush.

[0004] In the U.S. patents 6,128,930 and 5,463,882, the length of the plush is determined by the interval of the hook of the cylinder needle and the edge of the needle dial. In general, the plush fabrics produced by such techniques have a plush length of about 3mm. To make toys and puppets with the artificial furs or pelts, the plush length of 3mm cannot create a real-like appealing. To increase the plush length, the interval of the hook of the cylinder needle and needle dial edge must be greater. This may be accomplished by increasing the diameter of the cylinder. Then the sinker ring to hold the blade on the periphery of the cylinder also must have a greater diameter. As a result, the relative position and the dimensions of the blades and cylinder needles have to be changed. This will result in a wider gap between the blade and the cylinder needle and make severing of the loop difficult or impossible.

[0005] US-A-5,463,882 discloses a knitting machine according to the preamble of claim 1. The radial distance between the peripheral edge of the needle dial and the front edge of the cylinder needle cannot be adjusted.

[0006] CH-A-456 829 that adjustment of the radial distance between the needle dial and an upper end of the needle cylinder is critical.

SUMMARY OF THE INVENTION

[0007] Therefore, it is an object of the present invention to provide a knitting machine for manufacturing plush fabrics having plushes at a length of up to 12mm.

[0008] The above object is achieved by a knitting ma-

chine according to claim 1.

[0009] According an embodiment of the invention, the plush knitting machine includes latch-less cylinder needles located in a cylinder, latch needles located horizontally on a needle dial and a cutting unit. The interval of the peripheral edge of the needle dial and the cylinder needles can be increased by changing the dimension of the needle dial. The plush thread forms a loop on the hook of the latch-less cylinder needle, then the latch needle on the needle dial pulls the plush thread to form a longer loop. Finally the cutting unit severs the loop to form a plush fabric with a longer plush.

[0010] The foregoing, as well as additional objects, features and advantages of the invention will be more readily apparent from the following detailed description, which proceeds with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011]

FIG. 1 is a schematic view of an embodiment of the present invention.

FIG. 2 is a schematic view of an embodiment of the cutting unit of the present invention.

FIG. 3 is a schematic view of the present invention showing the cutting unit severing a loop to form a plush.

[0012] FIGS. 4 through 7 schematically illustrate an operation flow according to an embodiment of the invention to produce plush fabrics.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0013] Please referring to FIG. 1, the circular knitting machine has a knitting unit to produce plush fabrics, namely to transform threads to fabrics. The embodiment of the invention includes:

[0014] Latch-less cylinder needles 11 located in a cylinder 10, latch needles 21 located on a needle dial 20 and a cutting unit 30. The cutting unit 30 includes two sinkers 31 and 32 formed in one set (referring to FIG. 2) and a cam 33. The sinkers 31 and 32 are driven by the cam 33 to slide on two sides of each cylinder needle 11 at the same time. The sinker 31 has a blade 310 which can sever a loop 41 formed by a plush thread 40 to become lengthy plush (referring to FIG. 3).

[0015] According to the embodiment, the dimension of the needle dial 20 may be changed so that the interval D in the radial direction between the needle dial peripheral edge 22 and the front edge 112 of the cylinder needle 11 can be increased to 10-15mm. Hence the plush thread 40 held on the front edge 112 of the cylinder needle 11 can be pulled by the latch needle 21 to form a longer loop 41. Finally, the cutting unit 30 severs the loop 41 to form

a plush fabric with the plush length up to about 12mm.

[0016] Refer to FIGS. 4 through 7 for the manufacturing process for producing the plush. First, the plush thread 40 is fed between the tip 110 of a cylinder needle 11 and a second hook 210 of a latch needle, and a ground thread 50 is fed between a rear end 111 and the needle dial peripheral edge 22 (referring to FIG.4); while the latch needle 21 is moved leftwards (referring to FIG.5) and retracted, the cylinder needle 11 starts to move upwards so that the front edge 112 of the cylinder needle 11 is raised to an elevation where the plush thread 40 can be picked up; the plush thread 40 is latched by the second hook 210 of the latch needle and held on the front edge 112 of the cylinder needle 11 to form the loop 41; the latch needle 21 is retracted continuously to pick up the ground thread 50 and carry it to a sloped side 23; guided by the sloped side 23, the ground thread 50 is moved gradually beneath the second hook 210; then the ground thread 50 is moved below the plush thread 40 (referring to FIG. 6); thereafter the cylinder needle 11 is moved downward to stretch the loop 41 through the front edge 112 of cylinder needle 11. Thus through the interactions of the cylinder needle 11 and the latch needle 21, the loop 41 formed by the plush thread 40 can be directly knitted in the fabric formed by the ground thread 50. Finally the loop 41 can be severed by the cutting unit 30 to form the plush fabric with a longer plush.

Claims

1. A knitting machine for manufacturing plush fabrics, comprising latch-less cylinder needles (11) in a cylinder (10), latch needles (21) located on a needle dial (20) and a cutting unit (30); said cutting unit being configured for severing a plush thread (40) held on a front edge (112) of a latch-less cylinder needle (11) and extending to a latch needle (21) spaced from the front edge (112) of the cylinder needle (11); **characterized in that** the dimension of the needle dial (20) is adjustable such that the peripheral edge (22) of the needle dial (20) is spaced radially from the front edge (112) of the cylinder needle (10) at an interval (D) of 10 to 15 mm for producing plushes at a length of up to 12 mm.

Patentansprüche

1. Strickmaschine zur Herstellung von Plüschgewebe, mit zungenlosen Zylindernadeln (11) in einem Zylinder (10), Zungennadeln (21), die sich auf einem Nadelrad (20) befinden, und einer Schneideeinheit (30); wobei die Schneideeinheit zum Schneiden eines Plüschfadens (40) ausgelegt ist, der auf einem vorderen Ende (112) einer zungenlosen Zylindernadel

(11) gehalten ist und sich bis zu einer Zungennadel (21) erstreckt, die beabstandet zu dem vorderen Ende (112) der Zylindernadel (11) ist;

dadurch gekennzeichnet, dass die Abmessung des Nadelrads (20) so einstellbar ist, dass der Umfangsrand (22) des Nadelrads (20) unter einem Abstand (D) von 10 bis 15 mm radial beabstandet zu dem vorderen Ende (112) der Zylindernadel (10) ist, um Plüschschlaufen mit einer Länge von bis zu 12 mm herzustellen.

Revendications

1. Une machine à tricoter pour la fabrication de tricotés bouclettes comprenant des aiguilles de cylindre (11) sans clapet dans un cylindre (10), des aiguilles à clapet (21) situées sur un plateau d'aiguilles (20) et une unité de coupe (30); ladite unité de coupe (30) étant configurée afin de sectionner un fil de boucle (40) maintenu sur un bord avant (112) d'une aiguille de cylindre (11) sans clapet et s'étendant vers une aiguille à clapet (21) espacé du bord avant (112) de l'aiguille de cylindre; **caractérisée en ce que** la dimension du plateau d'aiguilles (20) est ajustable de telle manière que le bord périphérique (22) du plateau d'aiguilles (20) est disposé de manière radiale du bord avant (112) de l'aiguille de cylindre (10) à un intervalle (D) de 10 à 15mm pour la production de boucles présentant une longueur jusqu'à 12 mm.

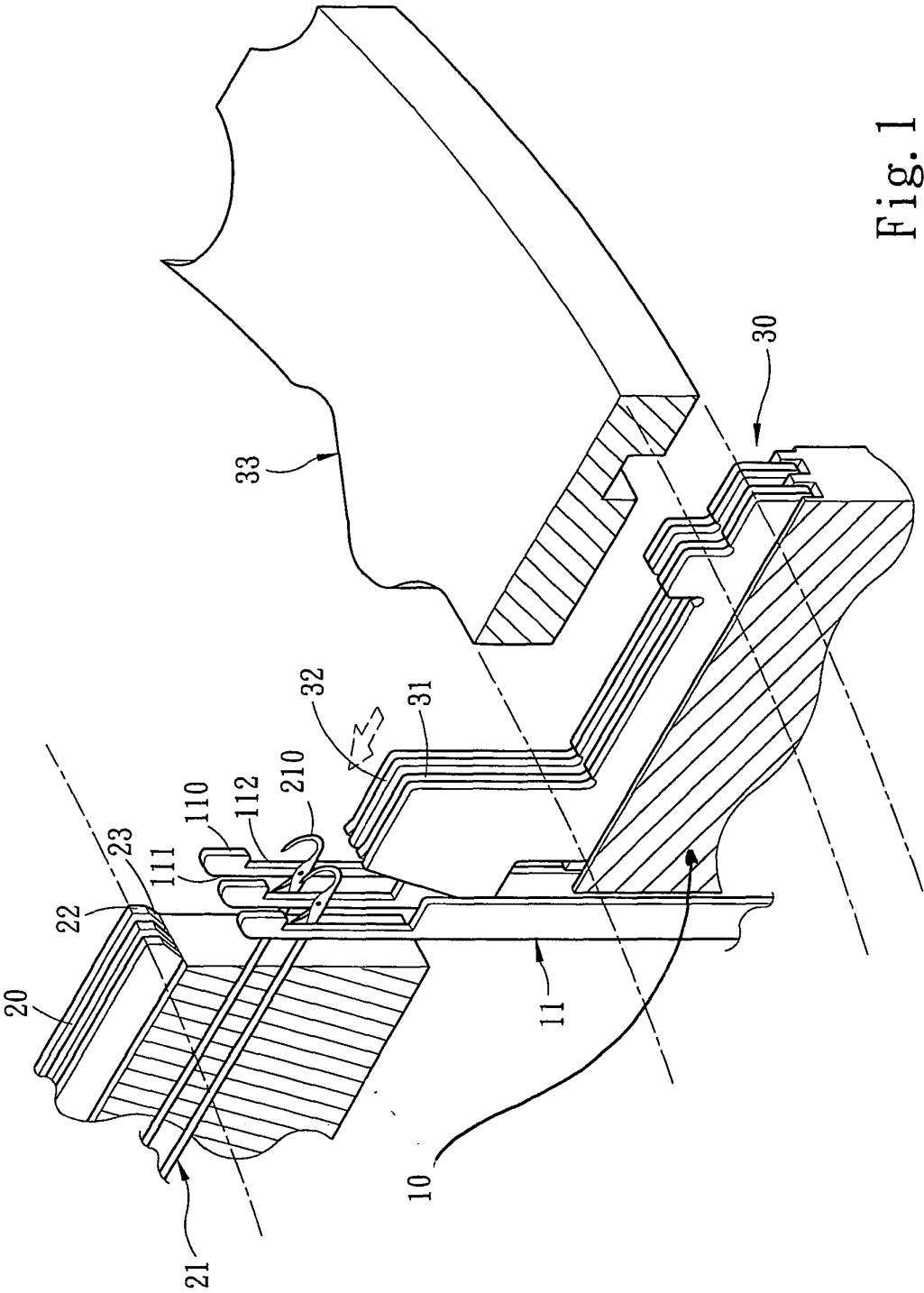


Fig. 1

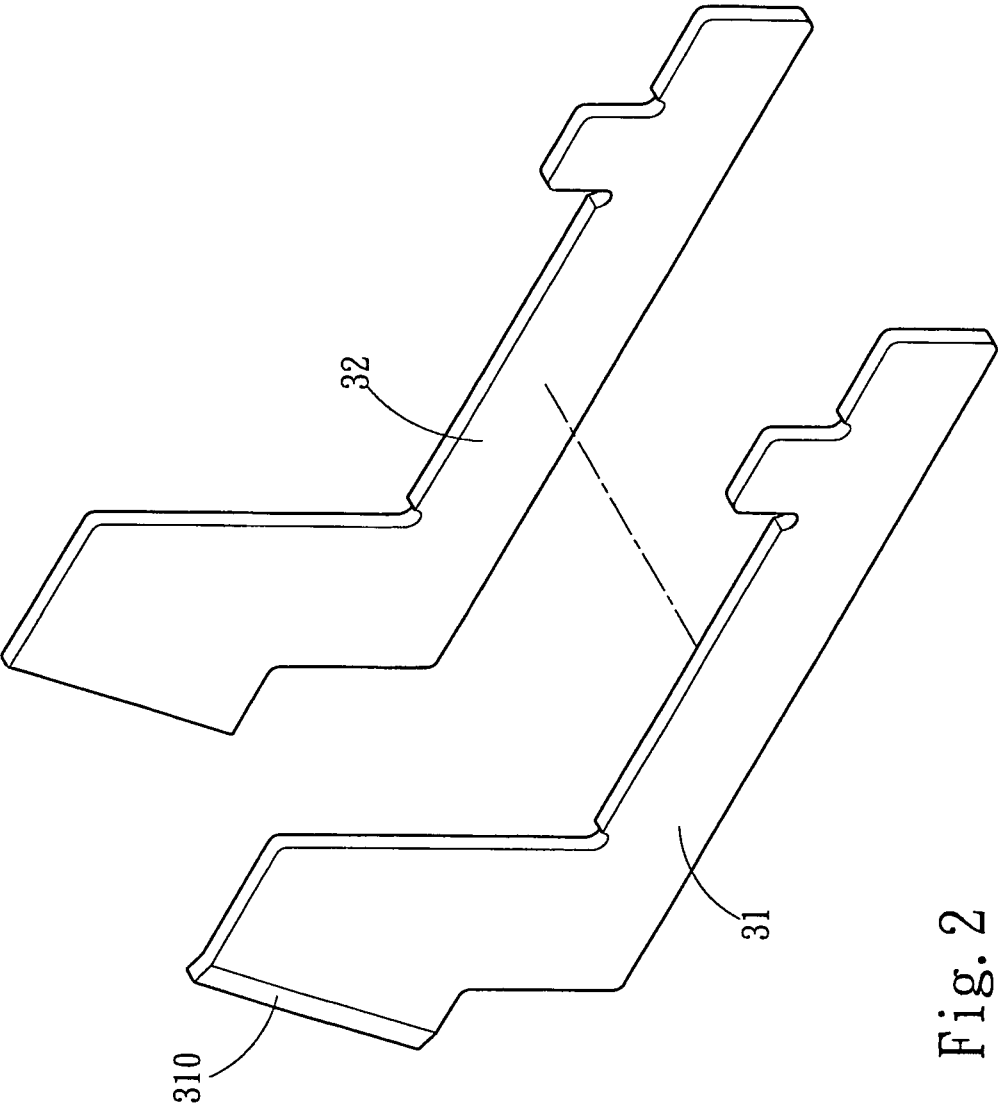


Fig. 2

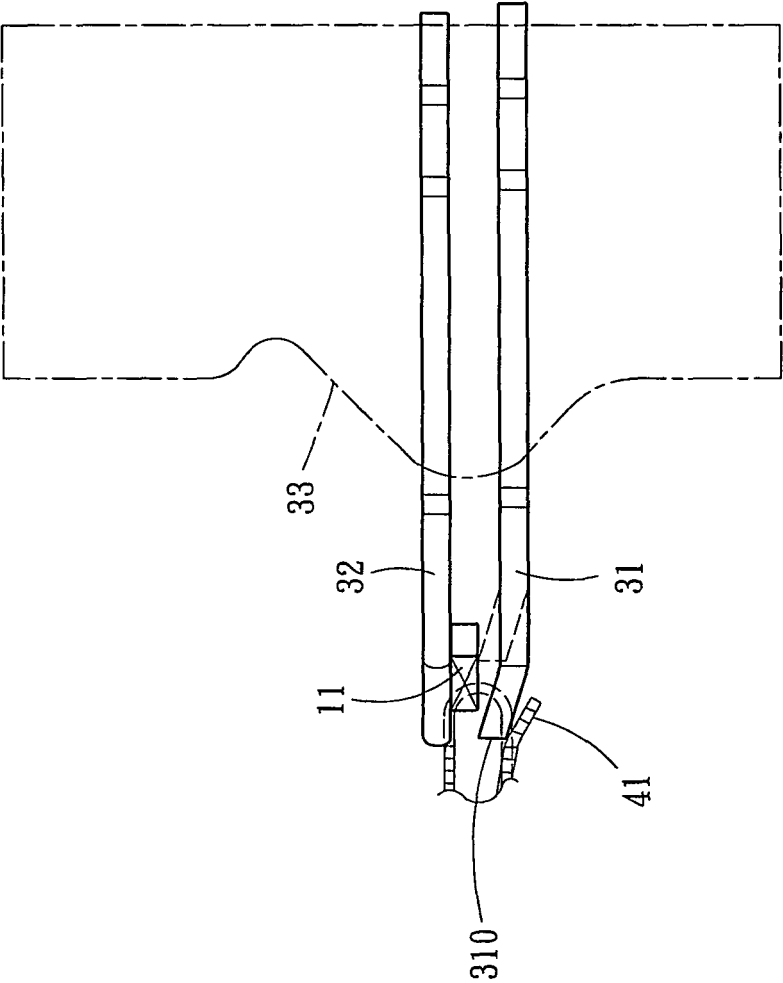


Fig. 3

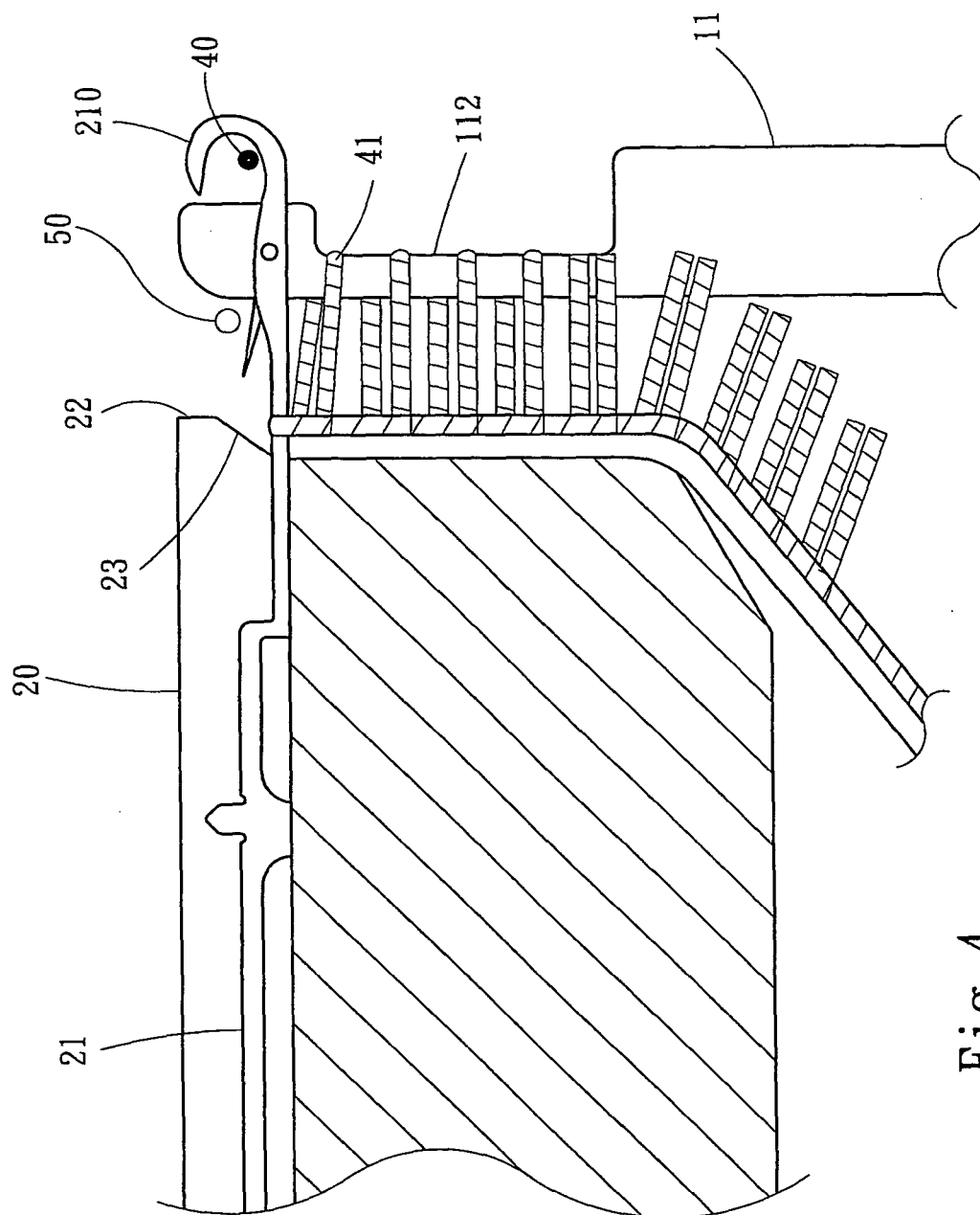


Fig. 4

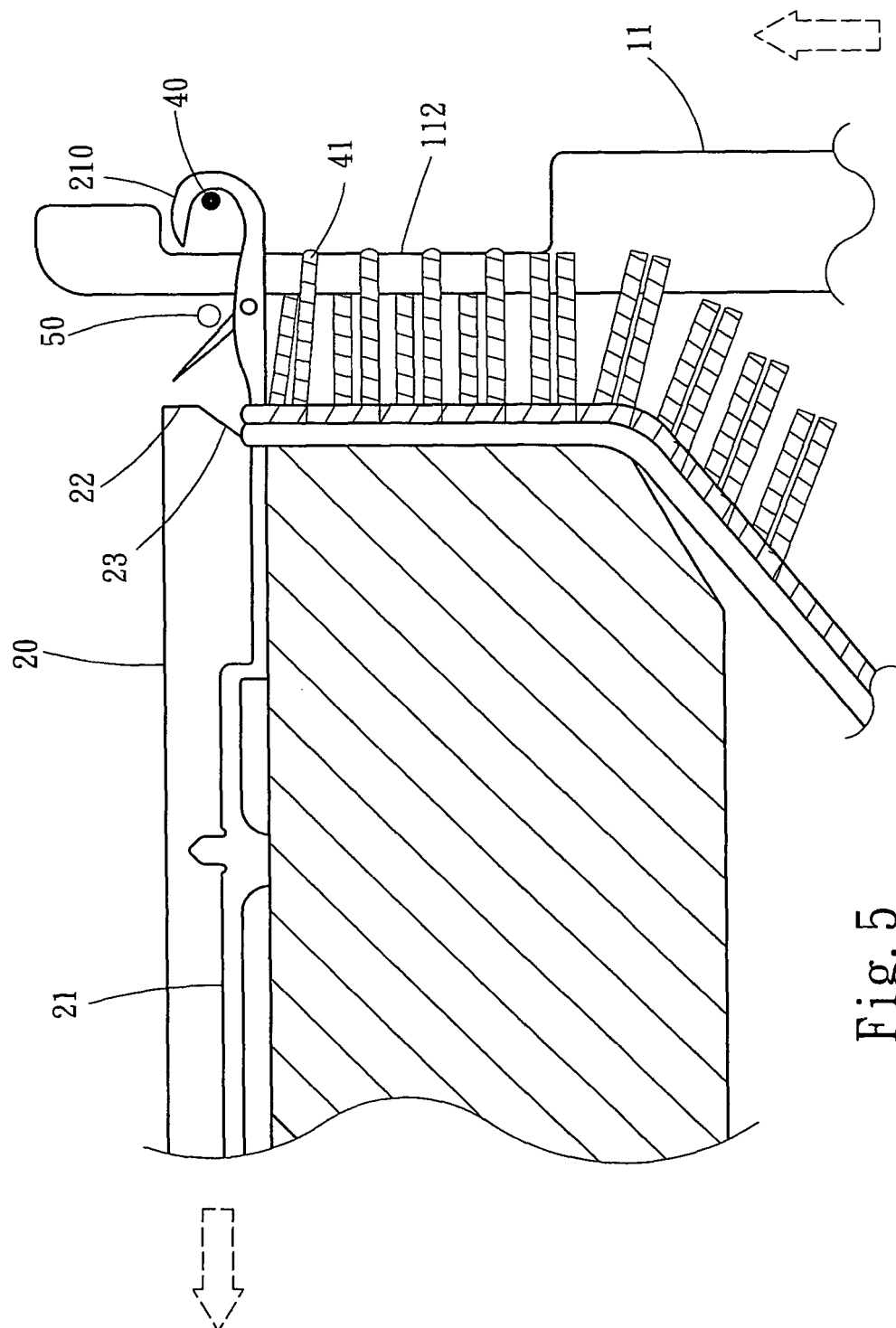


Fig. 5

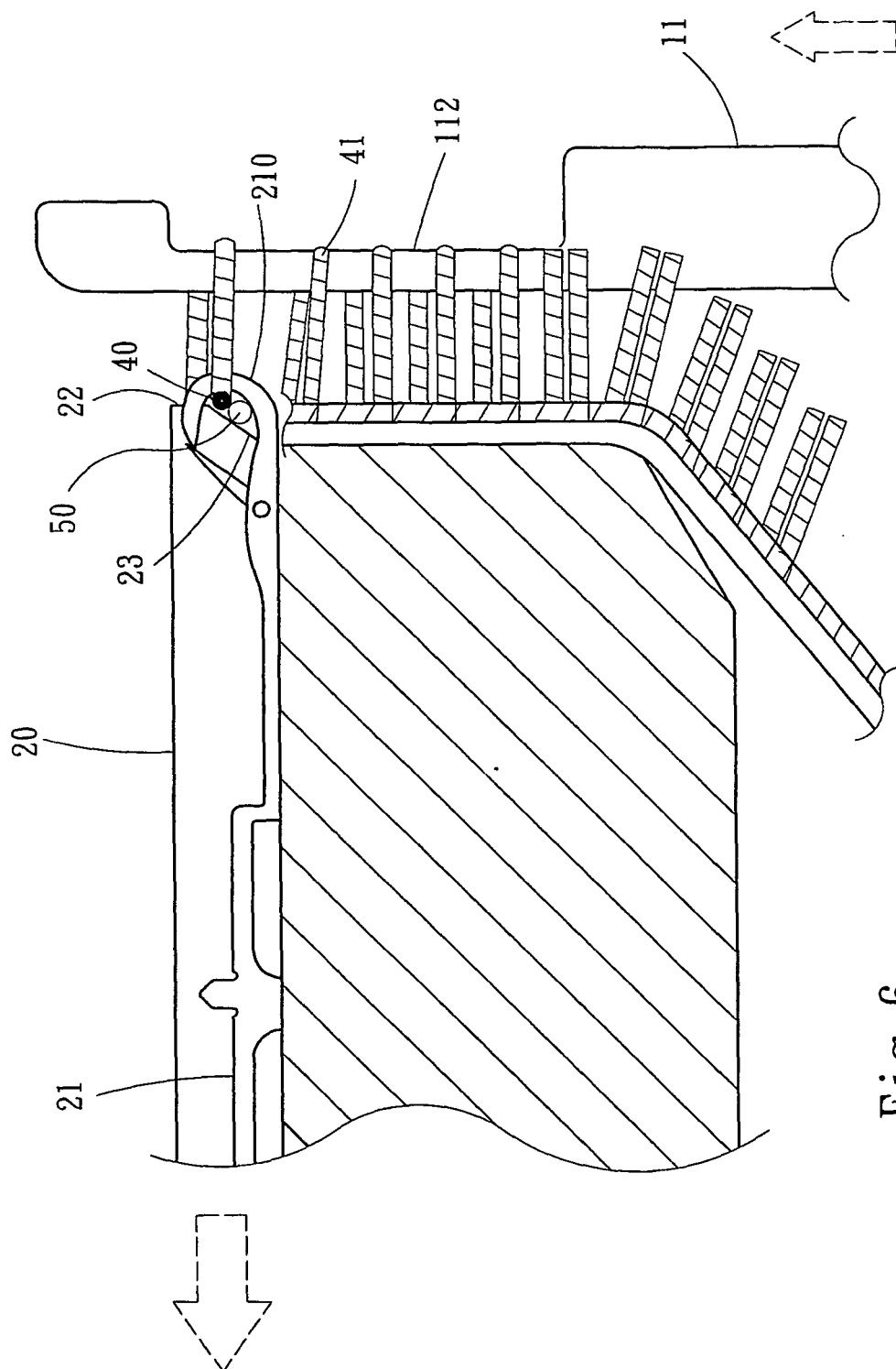


Fig. 6

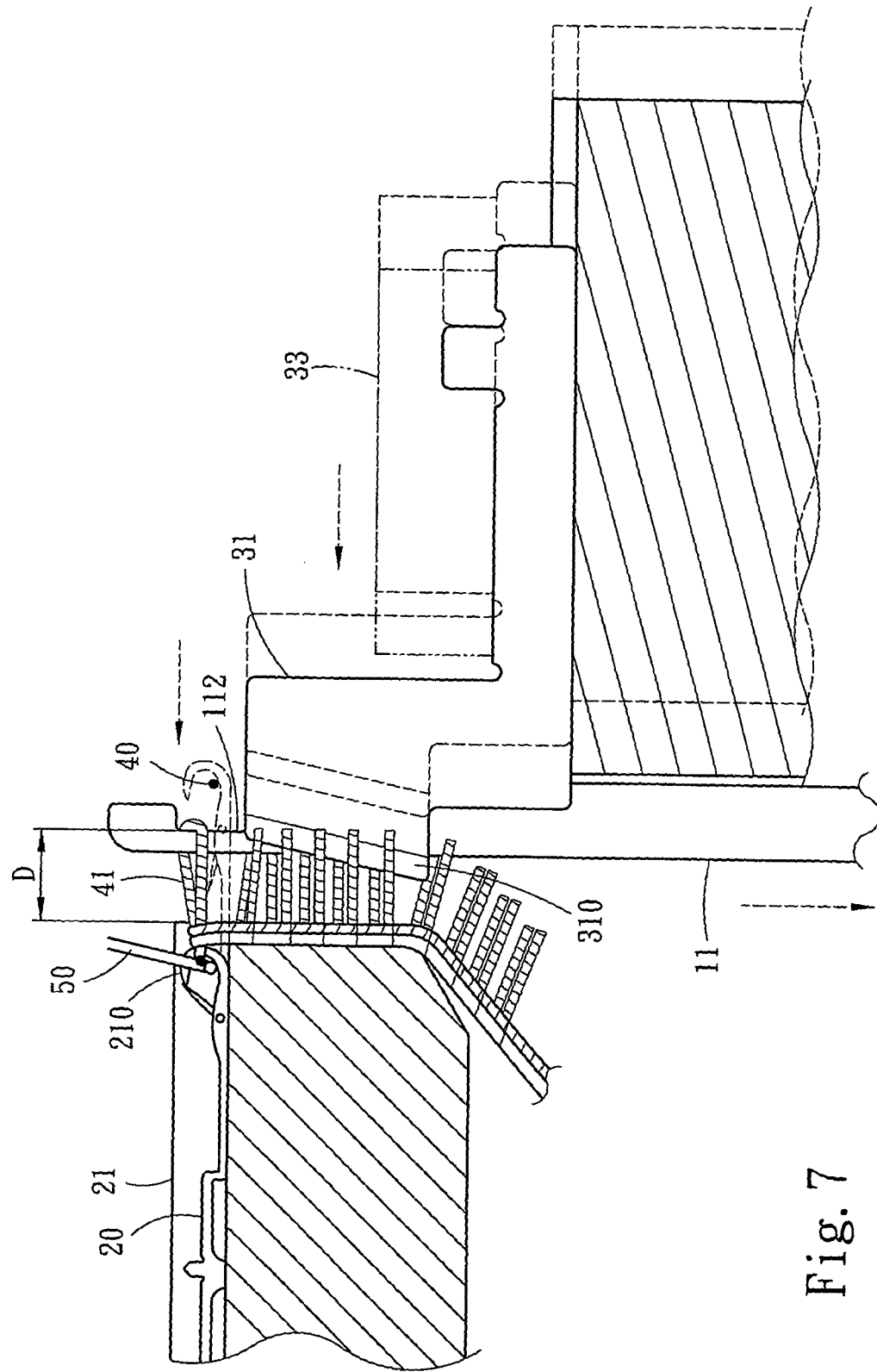


Fig. 7

REFERENCES CITED IN THE DESCRIPTION

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