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(54) **TRANSPARENT MAT RECLOSABLE FASTENER**

(76) Inventor: **Kuo-Ian CHENG**, Wuxi City (CN)

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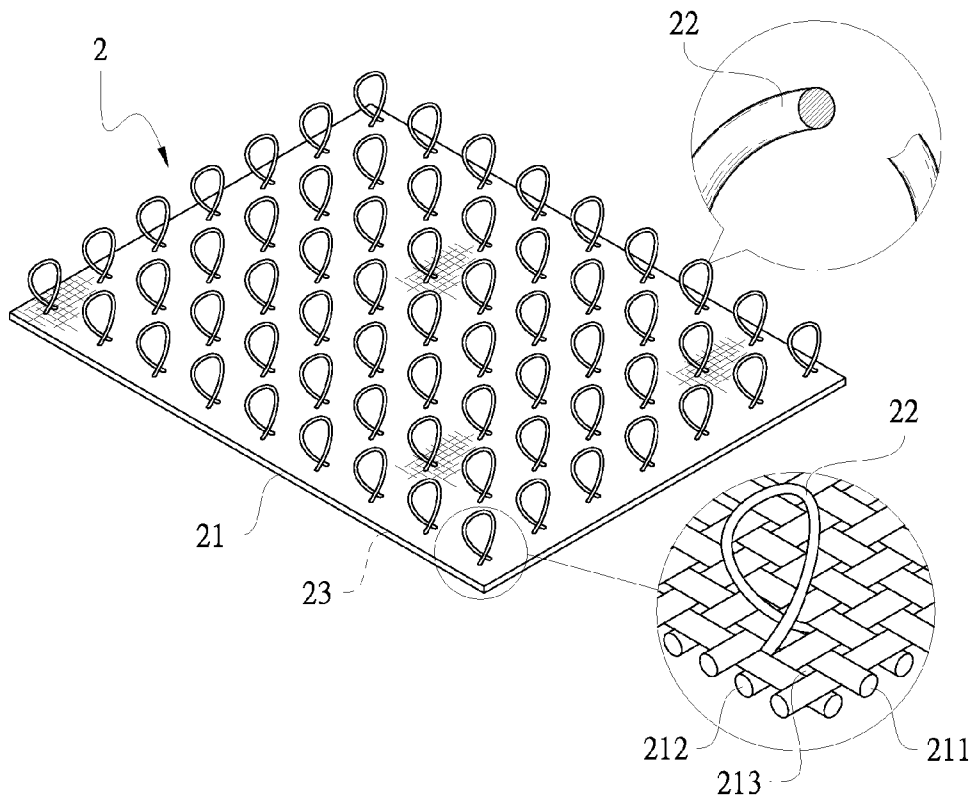
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(57) **ABSTRACT**

A transparent mat reclosable fastener comprises a bottom layer, in which a material is transparent or semi-transparent nylon monofilament, composed of weaving a plurality of warps and a plurality of woofs; a plurality of tufts interwoven to predetermined positions of a bottom layer through yarns in which diameters are smaller than diameters of the warps and the woofs and in which the materials are transparent or semi-transparent nylon monofilament such that the tufts are interwoven at a same direction together with the woofs and protrude the bottom layer; and a waterproof glue layer that is a transparent waterproof adhesive and that is adhered to a surface of the bottom layer. Accordingly, the reclosable fastener does not only have light transmittance and transparency, but also has light weight, thin thickness and softness. While incorporating with ejection hooks, the fastener has high pulling force and clear printing patterns.



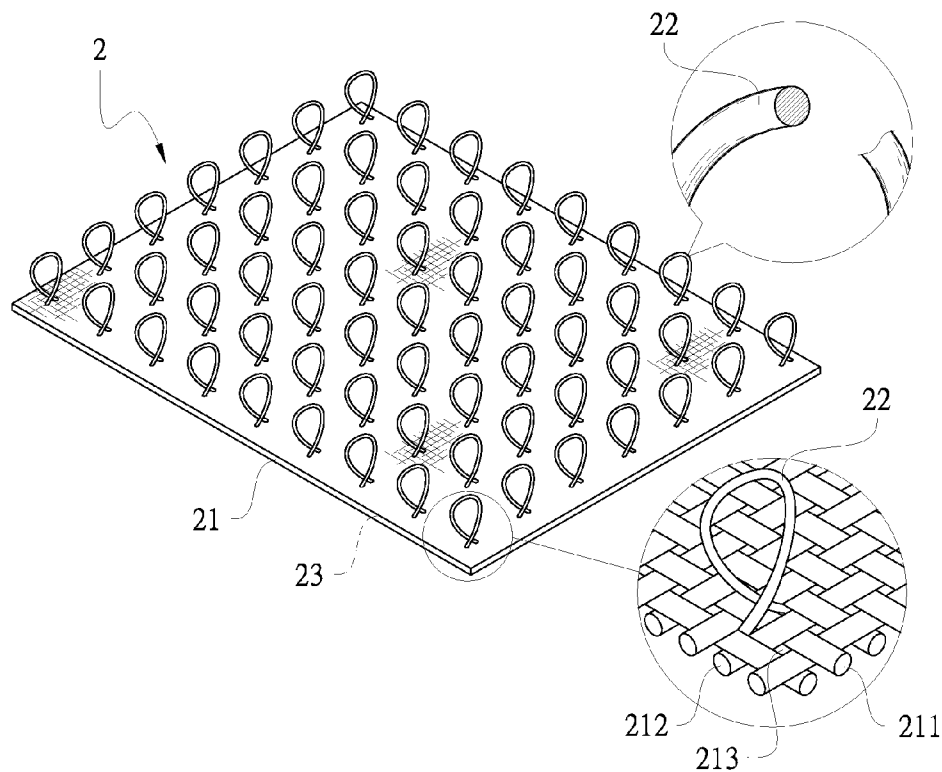


FIG. 1

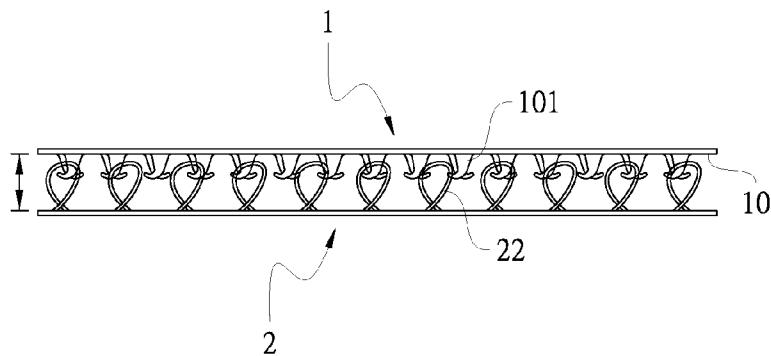


FIG. 2

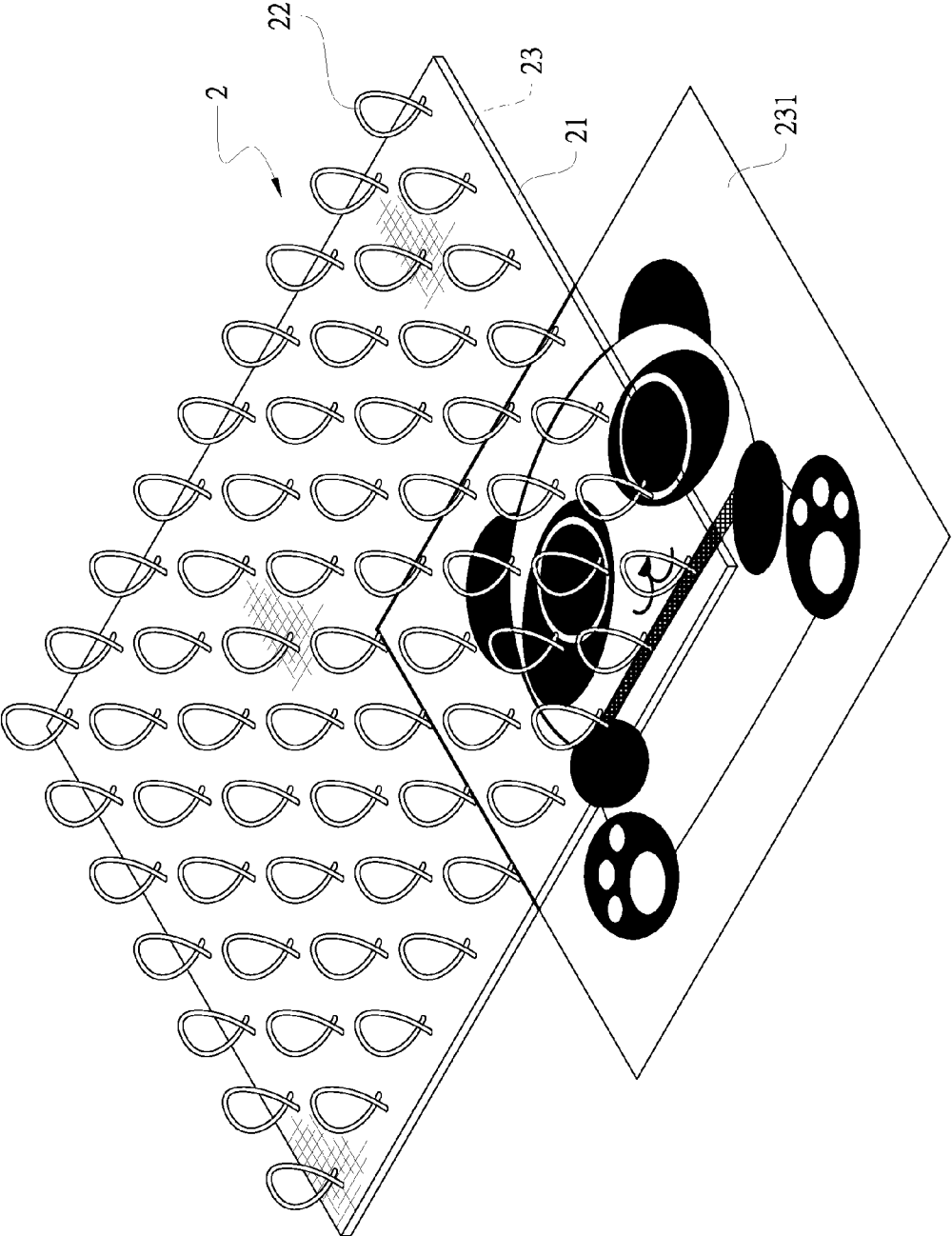


FIG. 3

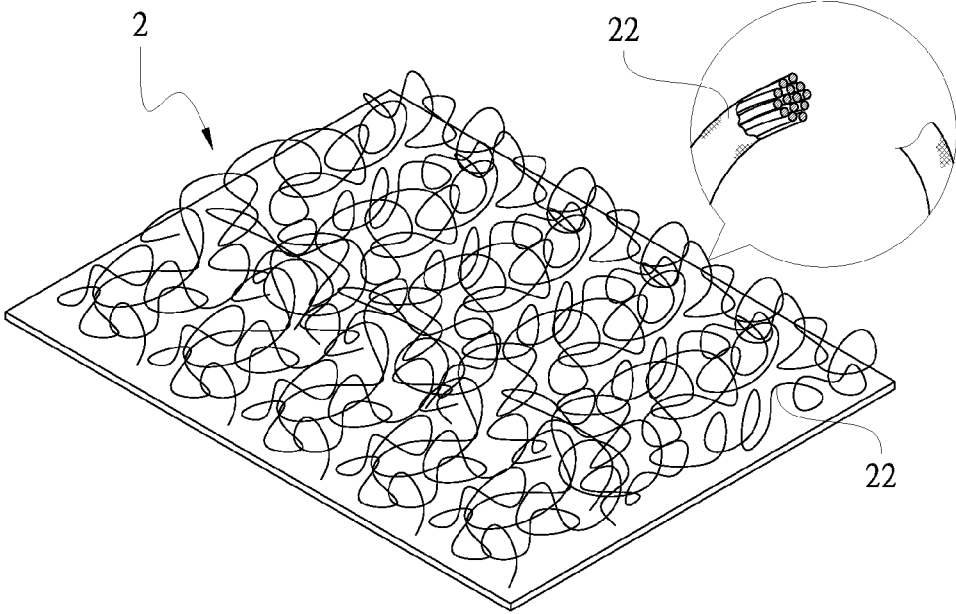


FIG. 4

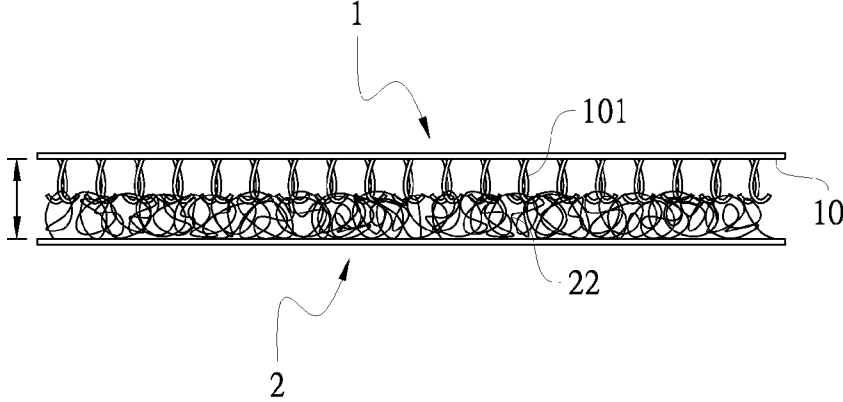


FIG. 5

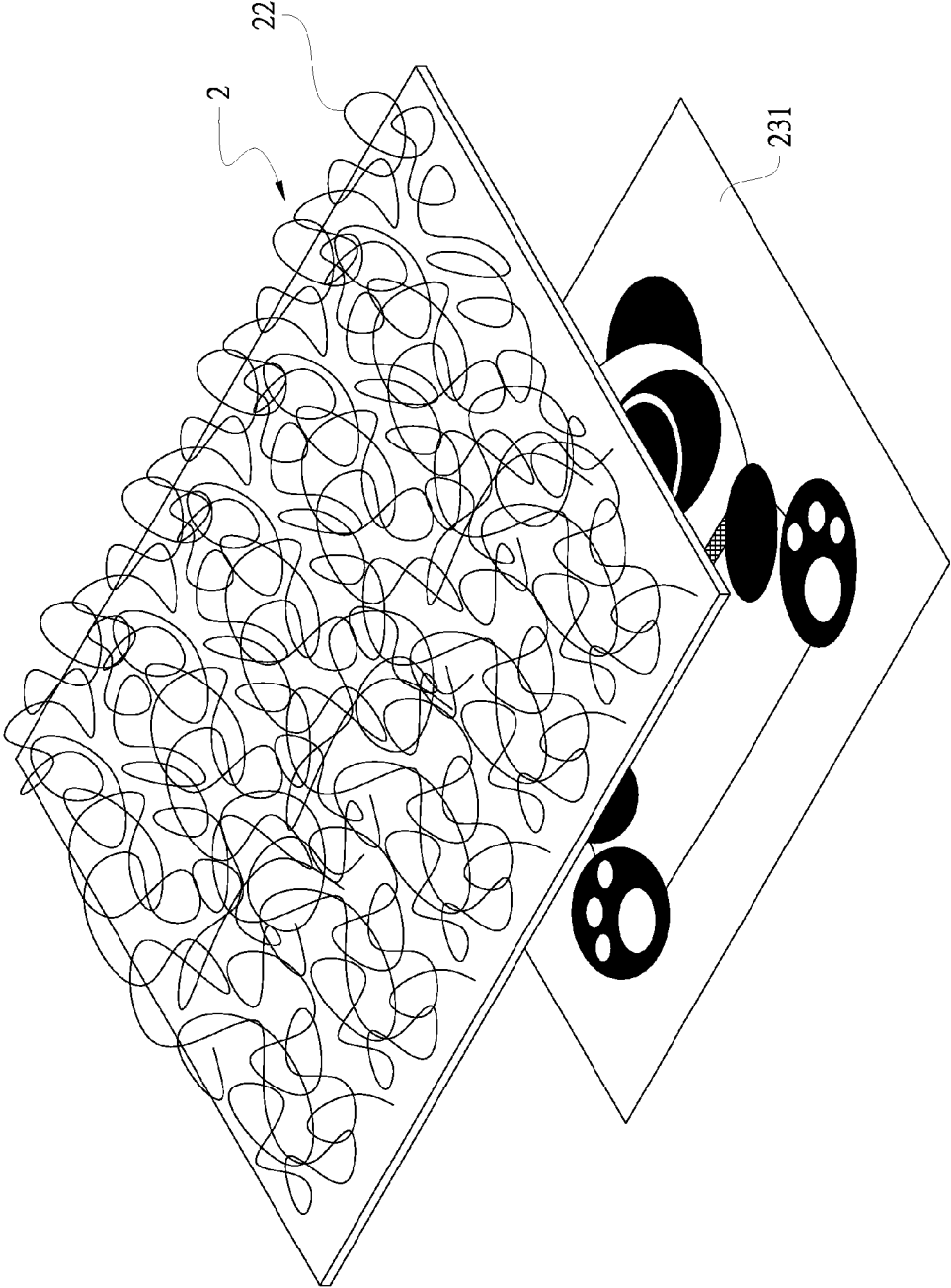


FIG. 6

TRANSPARENT MAT RECLOSABLE FASTENER

BACKGROUND OF THE INVENTION

[0001] (a) Field of the Invention

[0002] The present invention relates to a transparent mat reclosable fastener, and more particularly to a mat reclosable fastener having a light weight, bright transparency and high pulling force resistance and capable of enhancing additional value of practicality and economy.

[0003] (b) Description of the Prior Art

[0004] With reference to FIG. 4 and FIG. 5, a conventional reclosable fastener has been applied to daily life and is that after a hook reclosable fastener 1 (so called a male reclosable fastener) in which a surface 10 has a plurality of hooks (or ejection hooks 101) is hooked with a mat reclosable fastener 2 (so called a female reclosable fastener) in which a surface has a plurality of tufts 22, stronger hooking stress is formed to fasten both fasteners. When a user would like to separate both fasteners, he/she must impose forces to separate the hooks 101 from the tufts 22.

[0005] With reference to FIG. 4, FIG. 5 and FIG. 6, each tuft 22 of the mat reclosable fastener 2 is woven by a plurality of yarns. While in use (including post-utilization), the hook 101 is pulled and dragged to form fluffy state (so called fluff). However, the fluffy state and the bottom structure of the mat reclosable fastener 2 are hardness and not light transmittance. Consequently, light may not pass through the mat reclosable fastener 2, and pattern 231 may not be printed on the fastener either. Moreover, the conventional reclosable fastener has plural yarns that are interlaced without transparency, and hooked hairs are engaged to each other and may be easily broken. The shape of the conventional reclosable fastener is thicker while incorporating with machine sewing. The forging defects need to be overcome when the conventional product is applied to aspects of designs and commercial competitions.

SUMMARY OF THE INVENTION

[0006] In view of the shortcomings of the prior art, the inventor(s) of the present invention based on years of experience in the related industry to conduct extensive researches and experiments, and finally developed a transparent mat reclosable fastener, as a principle objective, that is woven by nylon monofilament to obtain the whole structure made of solidifying and shaping via a waterproof glue layer so that the mat reclosable fastener has light weight, bright, transparency and high pulling force resistance.

[0007] The mat reclosable fastener of the invention is incorporated with a hook reclosable fastener in which a surface has a plurality of ejection hooks and comprises: a bottom layer, in which a material is transparent or semi-transparent nylon monofilament, composed of weaving a plurality of warps and a plurality of woofs; a plurality of tufts interwoven to predetermined positions of a bottom layer through yarns in which diameters are smaller than diameters of the warps and the woofs and in which the materials are transparent or semi-transparent nylon monofilament such that the tufts are interwoven at a same direction together with the woofs and protrude the bottom layer; and a waterproof glue layer that is a transparent waterproof PU glue and that is attached to a surface of the bottom layer

[0008] In addition, another objective of the invention is to provide a transparent mat reclosable fastener. By coloring a decal pattern on a bottom of the waterproof glue layer, the additional value of practicability and economy benefit can be enhanced.

[0009] Accordingly, the mat reclosable fastener further comprises coloring a decal pattern on the bottom of the waterproof glue layer.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] FIG. 1 is a three-dimensional diagram of depicting a tuft that is monofilament structure according to an embodiment of the invention;

[0011] FIG. 2 is a schematic diagram of incorporating with a hook reclosable fastener according to the embodiment of the invention, wherein the diagram depicts that ejection hooks of the hook reclosable fastener are hooked between tufts shown in FIG. 1;

[0012] FIG. 3 is a schematic diagram of performing color matching on a bottom of a waterproof glue layer according to the embodiment of the invention, wherein the mat reclosable fastener has light transmittance so that patterns are clear and bright;

[0013] FIG. 4 is a three-dimensional of a conventional mat reclosable fastener depicting that

[0014] FIG. 5 is a cross-sectional drawing of depicting that hooks of a conventional hook reclosable fastener hook between tufts shown in FIG. 4;

[0015] FIG. 6 is a three-dimensional decomposition drawing of depicting that the bottom of a conventional mat reclosable fastener is unable to perform color matching and has bad light transmittance.

DESCRIPTION OF MAIN COMPONENT SYMBOLS

- [0016] 1 Hook reclosable fastener
- [0017] 10 Surface
- [0018] 101 Ejection hook
- [0019] 2 Mat reclosable fastener
- [0020] 21 Bottom layer
- [0021] 211 Warp
- [0022] 212 Woof
- [0023] 213 Pore
- [0024] 22 Tuft
- [0025] 23 Waterproof glue layer
- [0026] 231 Pattern

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0027] The foregoing and other technical characteristics of the present invention will become apparent with the detailed description of the preferred embodiments and the illustration of the related drawings.

[0028] With reference to FIG. 1 and FIG. 2 for a preferred embodiment of the invention is depicted and applied in using a hook reclosable fastener 1 in which a surface 10 has a plurality of ejection hooks 101. A mat reclosable fastener 2 of the embodiment comprises a bottom layer 21, a plurality of tufts 22 and a waterproof glue layer 23.

[0029] The bottom layer 21 has a plurality of interlaced pores 213 woven by a plurality of warps 211 and a plurality of woofs 212 in which the materials are transparent or semi-transparent nylon monofilament.

[0030] The tufts 22 are interwoven to predetermined positions of the bottom layer 21 through yarns in which diameters are smaller than diameters of the warps 211 and the woofs 212 and in which the materials are transparent or semi-transparent nylon monofilament such that the tufts are intervally woven at a same direction together with the woofs 212 and protrude the bottom layer 21.

[0031] The waterproof glue layer 23 is transparent and water resistant PU glue that is attached to the surface at the bottom of the tufts 22 and the warps 211 and the woofs 212 of the bottom layer 21 to adhere to and fasten the yarns of the bottom layer 21 and the tufts, thereby achieving flatness and polymerization.

[0032] The nylon is a commodity name of polyamide fiber industrially produced by U.S. DuPont.

[0033] In the embodiment, the material of the waterproof glue layer 23 is transparent polyurethane (so called PU) that is called PU glue.

[0034] The bottom layer 21 and the tufts 22 still keep light transmittance with certain degrees under bleaching or non-bleaching operation environment.

[0035] In the embodiment, the diameter of each warp 211 and each woof 212 is 0.16 mm. When the diameter of each tuft 22 is 0.08 mm, the density of the warps 211 is 120 dan, and the density of the woof 212 is 120 dan. The standing height of each tuft 22 is between 2.2 and 2.8 mm.

[0036] In addition, when the embodiment is combined with different ejection hook, the pulling force and peeling force test can obtain a table shown as the following:

		The pulling force and peeling force for combining with different ejection hooks				
Circulation times		0	1000 times	3000 times	5000 times	10000 times
Combining with No. ETN61 ejection hook	Pulling force Kg/cm ²	1.92	1.32	1.17	0.82	0.52
	Peeling force Kg/cm	0.170	0.139	0.125	0.117	0.091
Combining with No. ETN62 ejection hook	Pulling force Kg/cm ²	1.82	1.44	1.28	1.04	0.50
	Peeling force Kg/cm	0.162	0.148	0.121	0.100	0.108

[0037] With the foregoing combined components, please refer to FIG. 1, FIG. 2, FIG. 3 and the foregoing table according to the embodiment of the invention. Since the mat reclosable fastener 2 is totally woven by nylon monofilaments, the pore fineness of the bottom layer 21 and the tufts 22 is enhanced, and the density is reduced, and the light transmittance is increased. Further, while designing the tissue structure, the density of unit area of the tufts 22 is reduced to a half

(by comparing with prior art) to further enhance the light transmittance. After solidifying the whole structure composed of the monofilaments incorporated with the waterproof glue layer 23, the light diffusion of the mat reclosable fastener 2 is reduced, and the brightness is enhanced to totally allow the mat reclosable fastener 2 having brightness and transparency. In addition, the mat reclosable fastener 2 is light, thin and soft. While incorporating with the ejection hooks 101 of the hook reclosable fastener 1, both are tightly pasted to have high resistible pulling force and fatigue resistance.

[0038] With reference to FIG. 3 for a preferred embodiment of the invention is depicted. The embodiment further a printing of a pattern 231 on a back surface (another surface at the bottom layer 21 in which no tufts 22 are disposed thereon). Therefore, the embodiment can be designed upon demands to allow the mat reclosable fastener 2 having light transmittance such that the pattern 231 is clear, bright and has aesthetic feeling. Its does not only allow consumers to wear articles (such as clothes, shoes, etc) equipped with the invention, but also increases the competitive capabilities when companies produce the foregoing articles. Accordingly, the additional values of inventive step and economy are enhanced.

[0039] The invention improves over the prior art and complies with patent application requirements, and thus is duly tiled for patent application. While the invention has been described by device of specific embodiments, numerous modifications and variations could be made thereto by those generally skilled in the art without departing from the scope and spirit of the invention set forth in the claims.

What is claimed is:

1. A transparent mat reclosable fastener comprising: a bottom layer, in which a material is a transparent and semi-transparent nylon monofilament, composed of weaving a plurality of warps and a plurality of woofs; a plurality of tufts interwoven to predetermined positions of a bottom layer through yarns of a transparent or semi-transparent nylon monofilament, such that the tufts are intervally woven at a same direction together with the woofs and protrude the bottom layer; and a waterproof glue layer, being a transparent waterproof adhesive, adhered to and fastened on a surface of the bottom layer.
2. The transparent mat reclosable fastener as recited in claim 1, wherein a hack of the bottom layer has pattern printing.
3. The transparent mat reclosable fastener as recited in claim 1, wherein the waterproof glue layer is transparent waterproof polyurethane that is so called PU glue.
4. The transparent mat reclosable fastener as recited in any claims 1 to 4, wherein diameters of each warp and each woof are 0.16 mm, and a diameter of each tuft is 0.08 mm.
5. The transparent mat reclosable fastener as recited in claim 4, wherein a standing height of each tuft is between 2.2 mm and 2.8 mm.

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