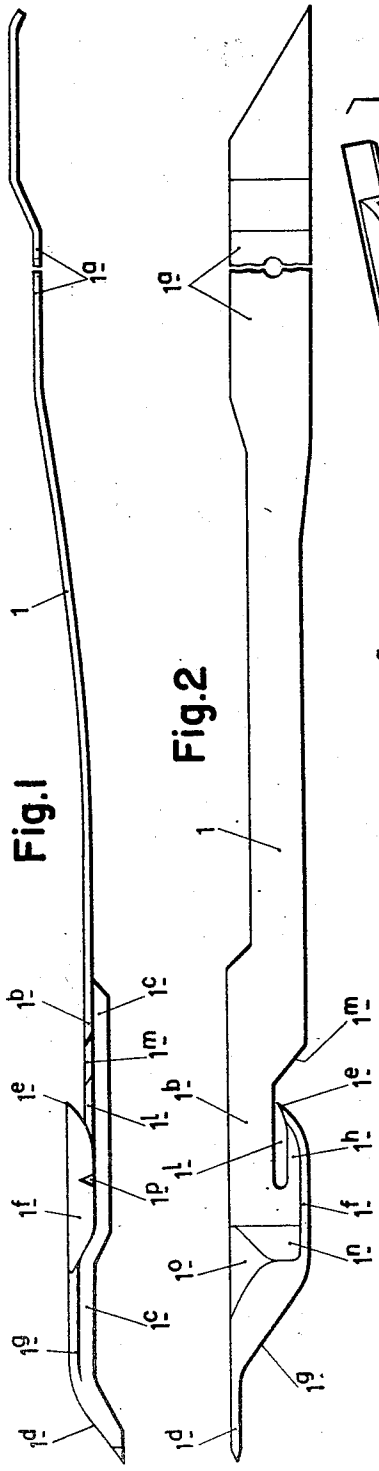
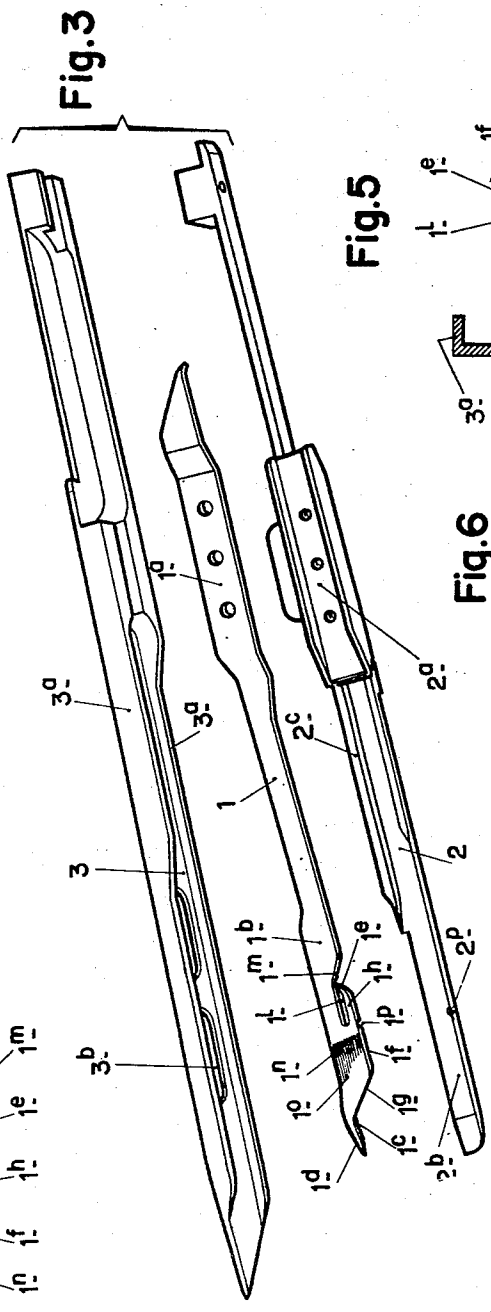
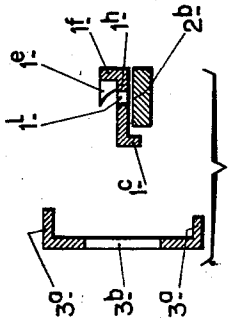
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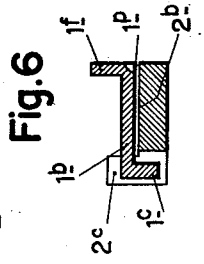
WEFT INSERTING DEVICE

Filed Aug. 27, 1948 2 Sheets-Sheet 1









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Sept. 18, 1951 R. DEWAS 2,567,993

WEFT INSERTING DEVICE

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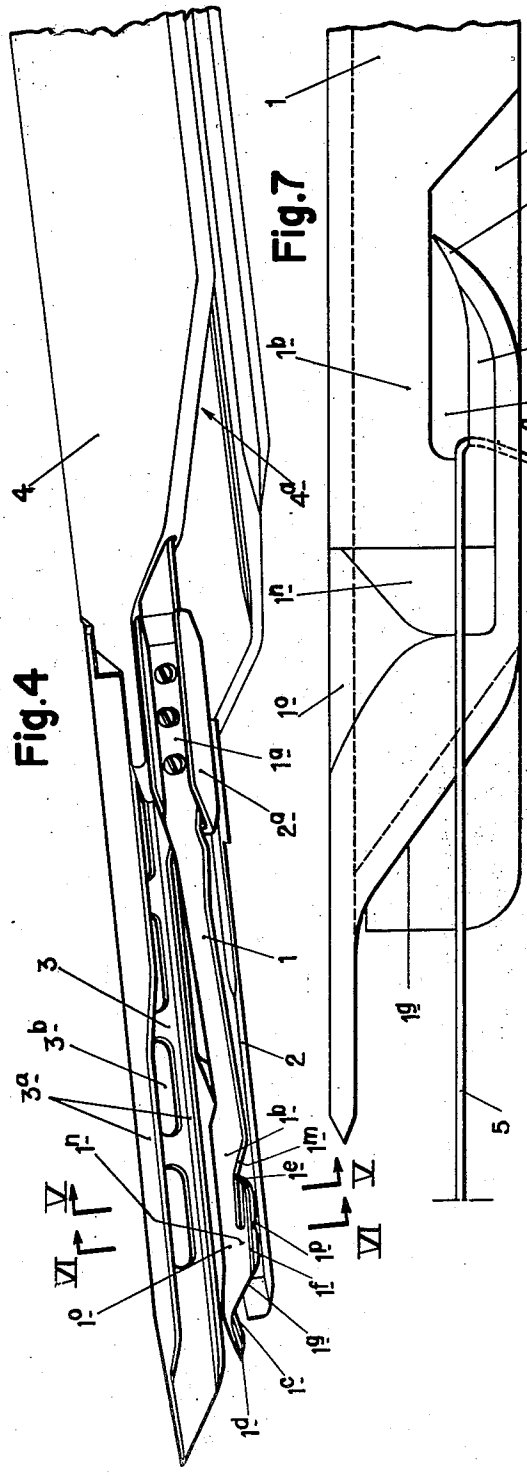


Fig.4

Fig.7

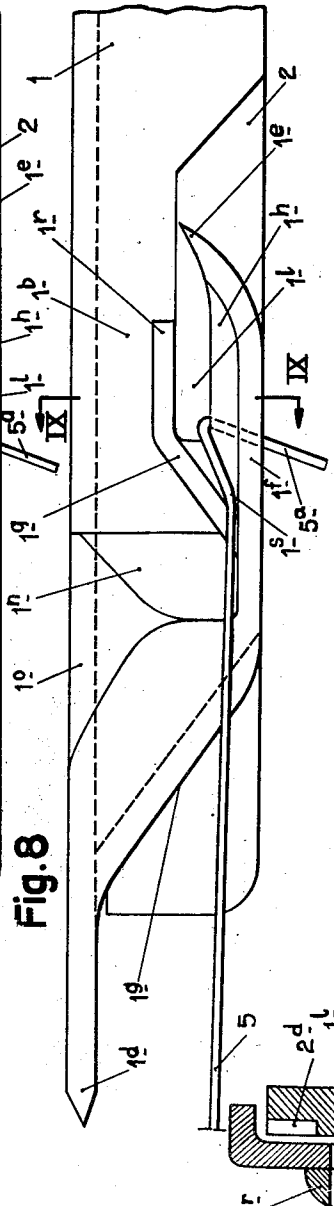


Fig.8

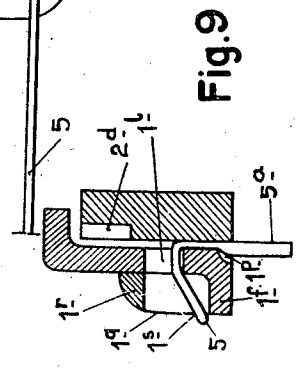


Fig.9

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WEFT INSERTING DEVICE

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In France September 9, 1947

12 Claims. (Cl. 139—122)

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The invention relates to weft-inserting devices for continuous feed weaving looms; it concerns weft-inserters comprising a holding member with a resilient clamp and more especially the holding member with a resilient clamp of the pulling needles of the type described and illustrated in the applicant's U. S. Patent No. 2,119,573 granted June 7, 1938, said type of needles being provided, on one or on both of the arms or branches of the resilient clamp, with means for enabling the weft thread which comes from the stationary bobbin and which is nipped by the clamp, to come into contact with the outer face of the resilient arm, said means, in addition to their not preventing the releasing blade from passing, enable the thread, stretched between the bobbin and the point of nipping, to produce automatically of its own accord, while it is unwinding, and by the actual effect of its tension, an increase of pressure of the resilient arm against the rigid arm and consequently an increase in the clamping force at the point of nipping, proportionally to said tension.

The invention relates in particular to the case in which said means are adapted to effect the exchange of the thread between the conveying needle and the pulling needle at the moment when said needles are being retracted towards their respective selvedge.

It is known that, in this case, said means comprise, inter alia, the arrangement, on the edge of the resilient arm located opposite the fell of the cloth, of a lateral notch extended by a longitudinal slit, the portion thus cut out forming an upturned tooth directed towards the rear of the clamp.

Practice has shown that in this type of pulling needle, the front portion of the resilient arm is weak and comparatively fragile, thereby making it able to become deformed and to break.

Furthermore, the sliding of the weft thread supplied by the conveying needle is effected over the upturned tooth, which causes a fatigue of the thread.

On the other hand, it sometimes happens, owing to a faulty adjustment of the clamp, that the free end of the thread tends, by the pulling force, to place itself in alignment with the portion coming from the bobbin and is thus liable to escape from the hook.

This having been explained, the invention has for its object to overcome these chief drawbacks and also others of less importance, as well as to provide additional improvements in the members in question.

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For this purpose, the invention provides improvements in the construction of the resilient clamp of the aforesaid type of pulling needle, and more particularly in the construction of its resilient arm or branch, said improvements being mainly characterized by the fact that the front portion of the resilient arm is provided with an angle section on each of its sides, the downwardly directed wing of the angle on the reed side edge extending over a comparatively great length, on the one hand towards the rear, beyond the zone containing the upturned tooth and the lateral notch, and on the other hand towards the front, so as to form the tip or nose of said resilient arm, whereas the upwardly directed wing of the angle on the fell side edge is of smaller length and extends from the front end of said edge to the tip of the tooth.

According to another feature of the invention, the end of the resilient arm extends beyond the end of the rigid arm, which, inter alia, offers the advantage of enabling the distance between the tip of the guard and the point of nipping of the thread to be decreased.

According to another feature of the invention, the angle on the fell side edge extends to the tip of the tooth, thereby making said tooth undeformable and enabling it to be given the shape of a hook, the tip of which is bent towards the reed, above the slit.

According to another feature of the invention, the width of the front portion of the resilient arm is decreased, which is made possible by the additional strength imparted by the angle sections, and enables a pulling clamp to be obtained wherein the front portion, along which the weft thread passes at the instant when the exchange is taking place, is narrower.

According to another feature of the invention, at about the height of or in line with the bottom of the slit extending the lateral notch, a nick is provided on the outside, which straddles the angle of the angle section on the fell side edge, said nick forming, with the face of the rigid arm against which the front portion of the resilient arm bears for nipping the thread, a kind of stop notch which facilitates the exchange and fixes the position of the free end of the thread.

According to a further feature of the invention, the stop notch may be provided on the rigid arm, or two stop notches may be provided, one on the resilient arm and the other on the rigid arm.

Owing to these improvements provided in the resilient clamp of the pulling needle, it will be

understood, in particular as regards the angle sections, that the one on the reed side is chiefly intended to compensate for the lack of strength of the resilient arm, and the angle section on the fell side fulfils two main purposes: it renders the hook rigid and remarkably facilitates the sliding of the weft thread owing to the fact that said weft thread does not have to hoist itself, so to speak, along said hook, so that the weft thread is still less fatigued and the safety margin in the longitudinal direction, which is necessary for the thread to be caught reliably by the hook, can be reduced to a strict minimum.

It will also be understood that by bringing the tip of the hook closer to the reed, and consequently to the guard, a further protection is obtained, all other things remaining equal, against an untimely penetration into the hook, of the warp threads which are pushed away by the guard.

It will further be understood that owing to the decrease of the width of the pulling clamp in the front portion thereof through which the weft thread passes, the margin is increased between the pulling clamp and the surface of the head of the conveying needle.

On the other hand, it should be noted that the elimination of the resilience of the front portion of the resilient arm owing to the provision of angle sections produces particularly important results, the applicant having found that the adjustment of the clamp is facilitated thereby and the life of the releasing blade is prolonged to a considerable extent, whereby many advantages are procured.

In order to enable the invention to be clearly understood, an embodiment of a pulling clamp of the type specified, involving the application of said improvements, is described hereinafter and diagrammatically illustrated, by way of a non-limitative example, in the accompanying drawings in which:

Fig. 1 is an elevational view of the improved resilient arm on the side facing the fell;

Fig. 2 is a top plan view thereof;

Fig. 3 is a perspective view, showing separately, before they are assembled, the rigid arm and the resilient arm, and also the guard;

Fig. 4 is a perspective view, showing the rigid and resilient arms assembled to one another, forming the improved resilient clamp, and also the guard, the assembly being shown mounted at the end of the arm of a pulling needle;

Fig. 5 is a view in transverse section along the plane V—V of Fig. 4;

Fig. 6 is a view in transverse section along the plane VI—VI of Fig. 4;

Fig. 7 is a plan view, on a larger scale, of the front end of the resilient clamp, showing the position of the thread during the pulling operation;

Fig. 8 is a similar view to Fig. 7, relating to a modification, and

Fig. 9 is a view in section along the line IX—IX of Fig. 8.

According to these figures, 1 is the resilient arm or branch, 2 the rigid arm, 3 the guard, 4 the arm or stock of the pulling needle, made of moulded plastic material for example, and the end of which is suitably shaped to enable the rear ends of the rigid arm 2 and of the guard 3 to be mounted and fixed thereon; 4^a is the groove provided laterally over the greater part of the length of the stock 4 in order to form a passage for the releasing blade, not shown, which

is mounted on a support located outside the shed, near the selvedge, said blade being intended, when the pulling needle is coming out of the shed, to separate the two arms 1 and 2 of the clamp and thereby release the end of the weft thread which is nipped between them.

The resilient arm 1 is fixed at its rear part 1^a, by means of screws or otherwise, in the rear part 2^a of the rigid arm 2, and is adapted to bear resiliently, by means of its front portion 1^b, against the front end 2^b of the rigid arm 2 so as to nip the weft thread.

As already stated, the improvements provided in the resilient arm relate particularly to the front portion 1^b thereof.

They are characterised in that said portion 1^b forms, opposite the reed, a right angle, the wing 1^c of which is directed downwards. Said wing is extended and forms the tip with an inclined ramp 1^d which extends beyond the end of the rigid arm 2. The portion of weft thread, stretched between the resilient clamp of the conveying needle and the support of same, slides over said ramp, straddles the upper surface of the resilient arm up to the tooth 1^h, when the two needles meet one another.

Opposite the fell, the portion 1^b of the resilient arm forms a right angle, the wing 1^f of which is directed upwards and extends from the tapered end 1^g to the tip 1^e of the tooth-shaped cut out portion 1^h that bounds the longitudinal slit 1^l extending the lateral notch 1^m.

The slope 1^n, on the reed side edge 1^o thereof, is of increased length, which reduces its slope and enables the thread coming from the bobbin, once it has been caught by the hook 1^e, to pass readily over the end 1^g and assume its self-tensioning position.

The end of the angle section 1^f forms the hook 1^e which extends above the slit 1^l.

Finally, at the height of or level with the bottom of said slit 1^l is provided a nick 1^p that straddles the outer angle of the resilient arm 1 opposite the fell. Said nick (Fig. 6) extends over a portion of the height of the outer face of said resilient arm and also over a portion of its inner face in contact with the upper face of the portion 2^b of the rigid arm. The weft thread 5 is stretched, while it is being pulled, between the feed bobbin and the point of nipping passing through the bottom of the slit 1^l where it forms a bend; the movement of its free end 5^a by sliding owing to the pull, and consequently the straightening out thereof in alignment with the portion coming from the bobbin, which might cause the thread to escape from the hook, are prevented by its engagement in the nick 1^p which forms a stop-notch.

In the modification shown in Figs. 8 and 9, the resilient arm 1 is provided on its upper face with a boss 1^q which is provided with an approach ramp 1^r extending alongside the slit 1^l. Said boss then passes round the bottom of said slit and merges obliquely into the wing 1^f of the angle section which it encounters at 1^s. Owing to this arrangement, the thread 5 caught by the hook 1^e mounts the boss 1^q, by means of the ramp 1^r, the oblique shape of said boss constraining the thread to continue to move up to 1^s, whereby as soon as it is stretched between the clamp and the bobbin, it is shifted sideways towards the side facing the fell. The bends thus formed, and the fact that the thread bears against the outer face of the resilient arm in a zone which is closer to the fell side edge and therefore at

the point where the self-tensioning force is of the greatest efficacy, further appreciably increase, for a given tensioning force of the clamp, the safeguard against an untimely slipping of the thread in the clamp.

The boss 1^q may originate closer to the hook 1^e. In this case, it may overhang the bottom of the slit 1^l so that the point 1^s may be located approximately at the height of the bottom of said slit 1^l.

As regards the rigid arm 2, its front portion on the reed side is decreased in width, thereby involving the elimination of the angle section 2^c (Fig. 3) over a certain length so as to leave room for the angle section 1^c of the resilient arm 1. Said front portion of the rigid arm 2 may be provided with a recess 2^d, formed for example in the manner shown in Fig. 9, for favouring the removal of the impurities pushed back by the releasing blade.

As regards the guard 3, the same is reinforced by right angle flanges 3^a and is at the same time lightened by holes 3^b.

It is of course to be understood that, without exceeding the spirit of the invention, it is possible to make improvements, modifications and additions, and also to consider the use of equivalent means.

For example, as hereinbefore stated, the stop notch 1^p may be provided on the rigid arm 2, as shown at 2^p (Fig. 3), or the clamp may be provided with two stop notches such as 1^p and 2^p respectively.

Likewise, the boss 1^q, after it has passed round the bottom of the slit 1^l, may encounter the angle section 1^f, for example at right angle, while gradually decreasing in thickness, so that the thread 5 caught in the hook and having mounted, by means of the ramp 1^r, the boss 1^q, extends downwards again in the direction of the angle section 1^f, so that in this case again, as soon as it is stretched between the clamp and the bobbin, it is shifted sideways towards the fell side edge. In this case, the boss may also overhang the bottom of the slit 1^l.

Such arrangements of the boss, or any other similar arrangements tending to produce the same result, may of course be applied by way of improvements to the boss 13 of the resilient arm 5 of the resilient clamp of the pulling needle described in the applicant's aforesaid patent.

I claim:

1. In a weft-inserting device for a continuous feed weaving loom having a front, a pulling needle comprising a nipping member having a resilient arm, the arm having a tooth on the edge facing the fell of the cloth and an angular section on the front portion intermediate the tooth and the bottom of the arm, the downwardly directed wing of the angular section extending from the apex thereof to the bottom, the upwardly directed wing of the angular section extending from the apex thereof to the tip of the tooth and relatively shorter than the downwardly directed wing.

2. In a weft inserting device for continuous feed weaving loom having a front and reeds, a pulling needle comprising a nipping member having a resilient arm, the arm having a tooth and a coacting lateral notch and a longitudinal slit extending the notch on the edge facing the fell of the cloth, the arm further having an angular section on the front portion on said edge intermediate the tooth and the bottom of the arm and extending in one direction downwardly to the bottom of the arm and in the opposite direction upwardly to the tip of the tooth, the top of the tooth being bent toward the reed and above the notch.

3. In a weft inserting device for continuous feed weaving looms having a rigid arm; a resilient arm coacting with the rigid arm and adapted to form a nipping member for the weft thread, the end of the resilient arm extending below and beyond the bottom of the rigid arm.

4. In a weft inserting device for continuous feed weaving loom having a rigid arm, a pulling needle comprising a nipping member having a resilient arm having a tooth and a co-acting lateral notch and a longitudinal slit extending the notch on the edge facing the fell of the cloth, and further having an angular section on the side opposite the rigid arm and a substantially narrow portion through which the weft thread passes at the instant of exchange.

5. In a weft inserting device for continuous feed weaving loom having a pulling needle comprising a nipping member having a resilient arm, the arm having a tooth and a coacting lateral notch and a longitudinal slit extending the notch on the edge facing the fell of the cloth, the arm further having a second notch on said edge aligned with the bottom of the lateral notch and adapted to prevent the thread from escaping from the tooth.

6. In a weft inserting device for continuous feed weaving loom having a pulling needle comprising a nipping member having a resilient arm, said arm having a tooth and a coacting lateral notch and a longitudinal slit extending the notch on the edge facing the fell of the cloth; a rigid arm against which the front portion of the resilient arm bears, the rigid arm having a notch on said edge aligned with the bottom of the longitudinal slit of the resilient arm when secured thereto and adapted to form with the resilient arm a stop notch.

7. In a weft inserting device for continuous feed weaving loom having a pulling needle comprising a nipping member having a resilient arm, said arm having a tooth and a coacting lateral notch and a longitudinal slit extending the notch on the edge facing the fell of the cloth, the resilient arm further having a second notch on said edge aligned with the bottom of the longitudinal slit; a rigid arm against which the front of the resilient arm bears and adapted to nip the thread, the rigid arm having a notch on said edge and adapted to coact with the second notch of the resilient arm when secured thereto.

8. In a weft inserting device for a continuous feed weaving loom having a front and reed sides; a pulling needle comprising a nipping member having a resilient arm with an angular section; a rigid arm against which the front portion of the resilient arm rests, the edges of the front portion of the rigid arm on the reed side being recessed, whereby said front portion is narrower than the rear portion of the rigid arm.

9. In a weft inserting device for continuous feed weaving loom having reed sides; a pulling needle comprising a nipping member having a resilient arm; a rigid arm, means securing the resilient arm to the rigid arm and adapted to provide a nipping member for the weft thread, the opposed face of the rigid arm being provided with a recess on the reed side.

10. In a weft inserting device for continuous feed weaving loom having reed side edges, a pulling needle comprising a nipping member hav-

ing a resilient arm, the arm having a tooth and a coacting lateral notch and a longitudinal slit extending the notch on the edge facing the fell of the cloth, the front portion of the resilient arm between the bottom of the slit and the bottom of the arm sloping toward the reed side edge.

11. In a weft inserting device for continuous feed weaving loom having a pulling needle comprising a nipping member having a resilient arm, the arm having a tooth and a coacting lateral notch and a longitudinal slit extending the notch on the edge facing the fell of the cloth, the arm further having on the upper face thereof an angular section intermediate the tooth and the bottom of the arm and a boss, a ramp for the boss, the ramp and boss extending alongside the

longitudinal slit and the bottom thereof to merge obliquely with the angular section.

12. In a weft inserting device for continuous feed weaving loom according to claim 11 in which the boss is characterized by gradually decreasing in thickness toward the edge facing the fell of the cloth.

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The following references are of record in the file of this patent:

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