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INTRAVAGINAL PACK AND ITS MANUFACTURE

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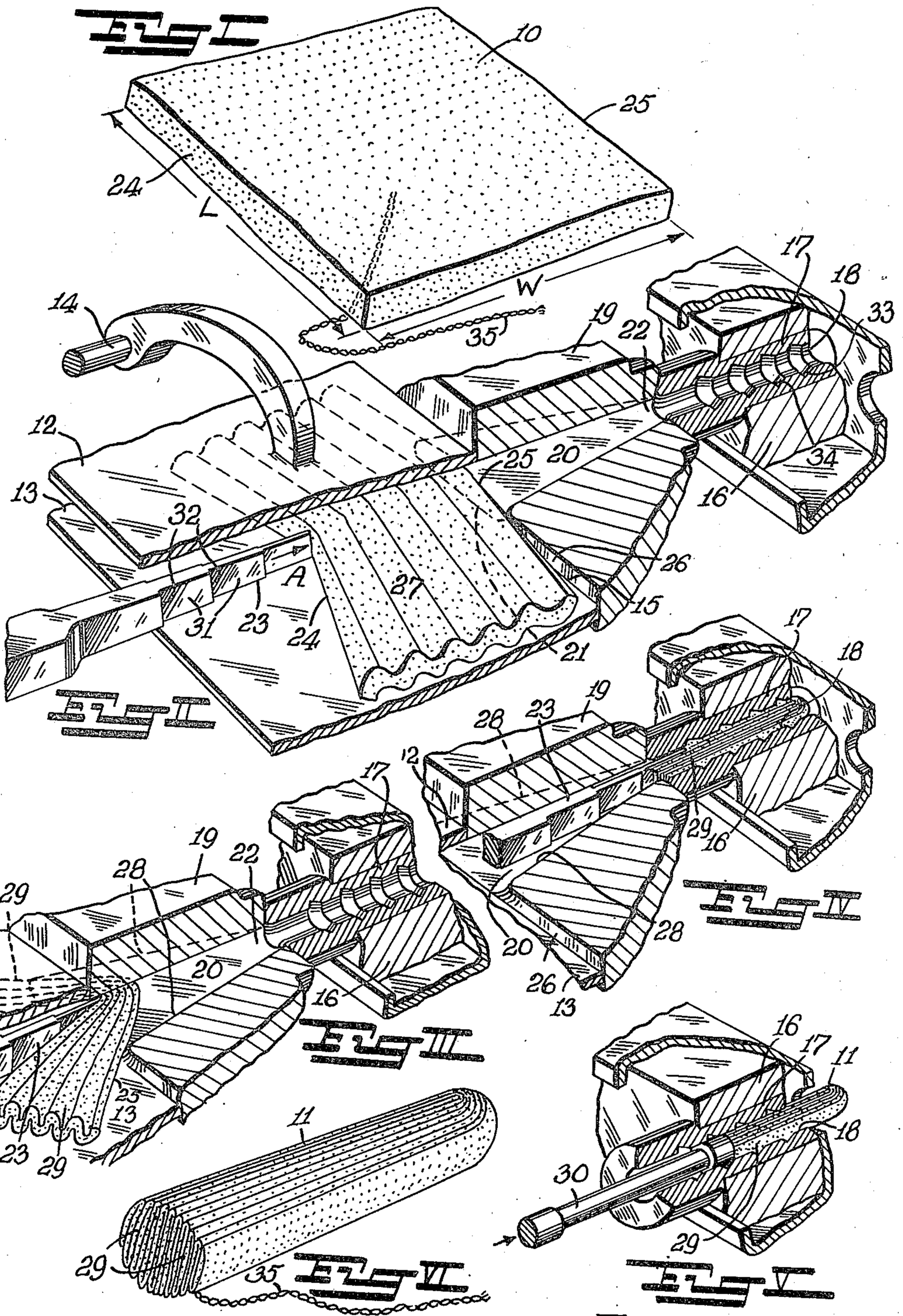

Fig I

Fig II

Fig III

Fig IV

Fig V

Fig VI

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INTRAVAGINAL PACK AND ITS MANUFACTURE

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2 Claims. (Cl. 128—285)

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This invention relates to absorbent packs for introduction into the vagina.

Desirable characteristics of such a pack are small initial volume in order to facilitate its introduction, and large absorptive capacity; and to attain them the pack is usually made of compressed cotton wool which is a material having high absorptive capacity relatively to its volume.

The cotton wool is obtained in sheet form, and in the operation of compressing the sheet and moulding it to the usual cylindrical shape of the pack by present methods, much of the original sheet surface becomes enclosed and overlaid. It appears to be the case however that the efficiency and speed of absorption by the compressed material depends a good deal upon the liquid that is to be absorbed having rapid and direct access to the original sheet surface. The present invention provides a compressed pack in which this availability of the original sheet surface persists in a high degree.

A pack according to the invention consists of absorbent sheet material, folded into a series of parallel and successively reversed pleats and compressed transversely to the lines of folding of the pleats. It may be additionally compressed in other directions. The pack is desirably of the usual rod shape, longer than its diameter, with the lines of folding of the pleats parallel to the length of the pack. The pack is preferably of cylindrical form; to attain which the rectangular cross sectional form that is the direct result of the pleating and the lateral compression of the pleats, is further pressed to circular cross section.

An important effect of the pleated formation is that re-expansion of the pack, due to its absorption of liquid, takes place primarily in the directions transverse to the lines of folding and thus to the length of the pack. This avoids any tendency of the pack to elongate when in use and absorbing moisture and consequent danger of extrusion from the vagina.

The pleated formation may be produced in various ways. According to a convenient method, the pleating is arrived at by a progressive procedure in which the flat sheet of material is converted into a corrugated sheet with the corrugations parallel to one another; and the corrugations are closed together until they are converted into the compressed pleats.

This procedure may be carried out by confining the flat sheet between a pair of plates covering the cut piece of sheet above and below and spaced apart by about the thickness of the sheet. One of the edges of the sheet which are to be

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lengthwise in the completed pack and to which the corrugations are to be parallel, is lodged against a member that acts as a stop to prevent bodily displacement of the sheet. The opposite parallel edge of the sheet is engaged by a member that moves in the direction of the stop. Such movement causes the flat sheet to assume the form of a corrugated sheet with the length of the corrugations perpendicular to the direction of compression and with the corrugations markedly even and permanent in the sense that further compression in the same direction does not alter the number of the folds or their positions relatively to the sheet material but only causes their pitch to be progressively reduced and the sheet material of which they are composed to become denser.

Preferably the pack according to this invention is of the hairpin form comprising two separate or separable legs united at a hairpin head at one end of the pack. This form is known and possesses certain specific advantages, one of which is that if the withdrawing cord is attached to the free end of one of the legs, the soaked pack although swollen in thickness, can nevertheless be withdrawn by means of said cord as a continuous strip doubled in length but of half the thickness it occupied in the vagina. Another advantage is that upon the introduction of the pack head first into the vagina said head becomes the first portion of the pack to receive moisture; and the head being thereby locally expanded, it causes the legs to spring apart to V shape and thereby anchor the pack in the vagina. The inclusion of the pleated structure in this hairpin form of pack, by increasing the tendency of the head to swell rapidly, enhances the spreading of the legs.

The invention is illustrated in the accompanying drawings viz.,

Figure I shows the raw material of the pack.

Figures II to V are perspective views showing essential parts of apparatus for making the packs, and illustrating stages in the method of manufacture.

Figure VI is a perspective view of the finished pack, drawn to a larger scale.

Referring to the drawings, Figure I shows the rectangular sheet 10 of cotton wool from which the pack is made. The length L of the sheet is about twice the intended length of the completed pack 11, Figure VI; whilst its width W is according to the intended density of the pack. Apparatus suitable for making the pack comprises a pair of parallel plates 12, 13 of such length and breadth as to receive the flat sheet 10 between them. Said

parallel plates are spaced apart by about the thickness of the sheet 10. The upper plate 12 can be swung back about a pivot 14 to enable the sheet 10 to be laid upon the lower plate 13, and then replaced.

Spaced away from the end 15 of the pair of plates is a member 16, in which is fixed a die 17 having a bore 18 of cylindrical form to shape the pack to its final cylindrical form.

Between said end 15 of the plates and said die 17 is a member 19 providing the funnel shaped passage 20. The function of said passage 20 is to mould the pack material, as the latter is pushed through it, from the form which said material has when it enters said passage 20, to the final cylindrical form of the die bore 18. With this object the cross sectional shape of said passage at its end 21 is that of a flat rectangle of the same width as the gap between the plates 12, 13 and the cross section changes progressively to the aforesaid final cylindrical form at the end 22.

23 is a blade positioned with its length extending in the direction A in which the sheet 10 is to be compressed and in which it is thereafter to be driven through the passage 20. The blade is also positioned with its width W, or greatest cross-sectional dimension, transverse to the confining plates 12, 13. Said blade can be moved in the direction of its length.

In making use of this apparatus, the sheet 10 is inserted into the casing as shown in Figure II, whereupon the blade 23 is applied to the centre of length of the edge 24 of the sheet that is distant from the funnel member 19, and is pushed forward in the direction of the arrow A. It thus drives the edge 24 of the sheet towards the opposite edge 25. Said edge 25 is held for a time substantially stationary by the end face 26 of the member 19. This action causes a series of even and parallel corrugations, indicated by 27 Figure II to appear in the sheet; and as the blade 23 continues to move forward, the corrugations are pressed together and thereby progressively assume the form of pleats.

At the same time the leading edge 25 of the sheet 10 begins to bulge into the passage 20 as shown in Figure III. There the converging walls 28 offer dragging resistance to the advance of the outer parts of the edge 25; so that the pleated sheet now progressively assumes a more rod-like form; and by bending at its centre where the blade pressure on it is concentrated, begins the formation of the two legs 29 turned back along the sides of the blade. Further blade advance, Figure IV, finally drives the doubled rod into the bore 18 which shapes it to cylindrical form. Since, in this operation, the thrust of the blade elongates the blank to some extent due allowance for such elongation is made in determining the length L of the sheet 10.

The blade 23 is then retracted but the shaped

pack may be left in the bore 18 for a time in order to set; and its setting may be assisted by such treatment as heating. The member 16 having been moved to another position, the completed pack is ejected from the bore 18 by a plunger 30, Figure V.

In order to facilitate the pushing forward of the pack material: to prevent said material being cut through by the blade; and to ensure that the pack is not retracted from the bore 18 when the blade is withdrawn, the blade is formed in steps 31 progressively diminishing in thickness towards the free end of the blade and providing the narrower thrusting shoulders 32. Also in order further to combat the tendency of the blade to retract the pack from the bore 18, the latter is formed with a number of annular grooves 33 providing the forwardly directed acute edges 34 that are effective to resist movement of the pack in the backward direction.

A withdrawing cord 35 is sewn to the free original sheet 10 in the proper position to appear at the end of one of the legs 29.

We claim:

1. The method of making a vaginal pack from a materially rectangular sheet of compressible absorbent material, which consists in forming the sheet into a series of parallel corrugations and compressing said corrugations transversely to the length of their ridges and thereby converting them into pleats and compressing the pleated article to coherent rod form.

2. A vaginal pack of rod shape substantially longer than its diameter and of materially cylindrical form, formed of a sheet of absorbent material which sheet is in its lengthwise dimension at least equal to the length of the final pack, said sheet folded—at lines of folding that are parallel with the length dimension of the sheet and transverse to the width dimension of the sheet—into a series of parallel and successively reversed pleats, the pack being compressed transversely to its length and to said lines of folding, which lines are preserved lengthwise in the final pack.

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