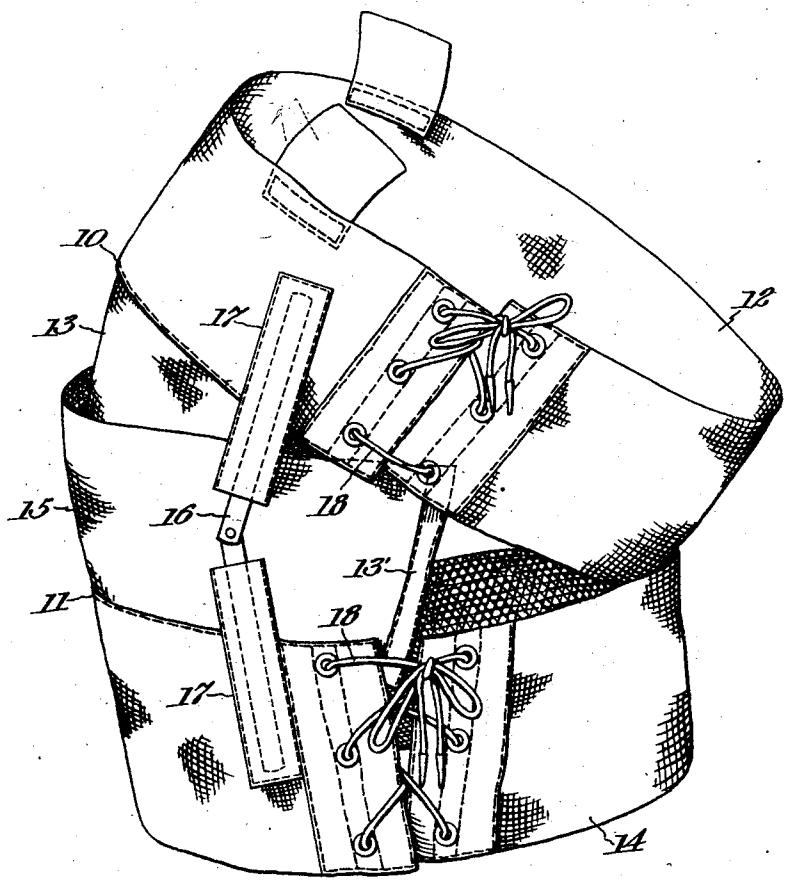
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KNEE SUPPORTER

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KNEE SUPPORTER.

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This invention relates to orthopædic appliances for the protection of the knee joint.

The object of the invention, its function and advantages will fully appear from the description in connection with the appended drawing which is a side view of a knee support embodying the invention.

The device is made of fabric which may be stretched in one direction and has substantially no elasticity in the direction at right angle thereto, and comprises principally two main parts which are secured above and below the knee respectively, an upper portion 10 and a lower portion 11.

The upper part comprises a band 12 adapted to close around the leg like a garter and an apron portion 13 extending downwardly therefrom.

The lower part 11 comprises likewise a band 14 and a portion 15 extending upwardly therefrom.

The apron portions 13, 15 terminate at the sides of the device, and the adjacent ends of these portions are overlapped and preferably covered with binding strip 13′, which strip, together with the stitching which connects the apron portions, serves as a hinge connection between the parts 10 and 11 but substantially prevents movement of the parts 10 and 11 away from each other. On the other hand, the fabric is distinctly elastic in the direction lengthwise of the portions 12 and 14 so that the device freely adjusts itself to the leg for the various positions. As the aprons 13, 15 are joined only at their ends, the intermediate sections are free to work freely over each other in the same manner as the sections of a cuirass, and respond to every movement of the knee in walking or sitting.

The function of the device is obvious. The portions 12 and 14 are applied around the leg above and below the knee respectively so as to securely stay in place in any position of the leg. In other words, the bands must be initially under such tension that the upper and the lower leg portions are mechanically coupled together and that in particular the lower leg is mechanically supported from the upper leg. When the proper adjustment is made, the knee joint and the ligaments thereof are effectively relieved of the ordinary strain since the fabric does not yield lengthwise of the leg. The fabric is primarily a mechanical coupling and serves this purpose well, since it is flexible and readily yields in all directions except in the direction indicated. The leg portion below the knee is free to move angularly, but is continuously supported so that all strain is taken off the knee joint.

However, it is very often desirable to not only relieve the knee joint of strain in up and down direction but also to relieve it of strain in any angular position. For this purpose I have provided a mechanical hinge joint 16 which may advantageously consist of two shanks loosely received in pockets 17 on the parts 10 and 11. The pivotal connection between these shanks is preferably such that it has a distinct frictional resistance which tends to maintain any angular position without unduly impeding angular motion.

The significance of this feature is this:

When the leg assumes any particular angular position, the hinge 16 tends to maintain it and the ligaments are therefore relieved to a greater or lesser extent from duty, and tension is thus largely eliminated. During walking the function of the hinge connection is even more pronounced. The lower leg portion represents a certain weight. During locomotion the upper ligaments and muscles cause the angular movement of the upper leg while other ligaments associated with the knee joint or at least affecting it, sustain the lower leg portion in its angular positions relatively to the upper leg portion and automatically control the changes in angular position.

By the device described the knee joint may be maintained in a state of rest without materially limiting locomotion.

The garter portions 12 and 14 open at one side of the support and the ends may be closed upon each other by lacings 18 or by other suitable means. The lacings 18 serve not only to close the garters but to adjust the tension in the same. When non-adjustable fasteners are employed, it is desirable to provide suitable means for the adjustment of the tension.

I claim:—

1. A knee support comprising two overlapping fabric members having means for securing them to a leg above and below the knee respectively, the two members being

free from each other except at the two opposite sides to permit relative angular movement in accordance with the flexing movement of the leg at the knee joint.

2. Device according to claim 1 in which the fabric is elastic in the direction around the leg and is inelastic lengthwise of the leg.

3. Device according to claim 1 in which the upper member comprises a garter portion and an apron portion depending therefrom and the lower member comprises a garter portion and an apron portion extending upwardly therefrom, the apron portions being partly in overlapping relation and the attachment between the two sections being effected near the free ends of the apron portions.

4. A knee support comprising two fabric sections having means for securing them to a leg above and below the knee respectively, the two sections being attached to each other at two opposite points so as to permit relative angular movement in accordance with the flexing movement of the leg at the knee, and a mechanical hinge connection between the two sections near one point of attachment offering a material frictional resistance to angular movement.

5. Device according to claim 4 in which the hinge connection has shanks loosely received in pockets on the two fabric sections respectively.

6. A knee support comprising two sections having means for securing them to a leg above and below the knee respectively, an apron depending from the front of the upper section, an apron extending upwardly from the front of the lower section, said aprons being arranged in overlapped relation and terminating at the opposite sides of the support, and means cooperating with said aprons to secure said sections together at the opposite sides of said support, said securing means permitting relative angular movement of said sections.

7. Device according to claim 6 in which said sections open at one side of the device and are provided with means for holding the same in closed position.

In testimony whereof, I affix my signature.

(Mrs. A.) BESSIE B. VAN HARLINGEN.