(No Model.)

H. P. RICHARDS.

PRESSER FOOT FOR SEWING MACHINES.

No. 601,402. Patented Mar. 29, 1898.

Fig. 1.

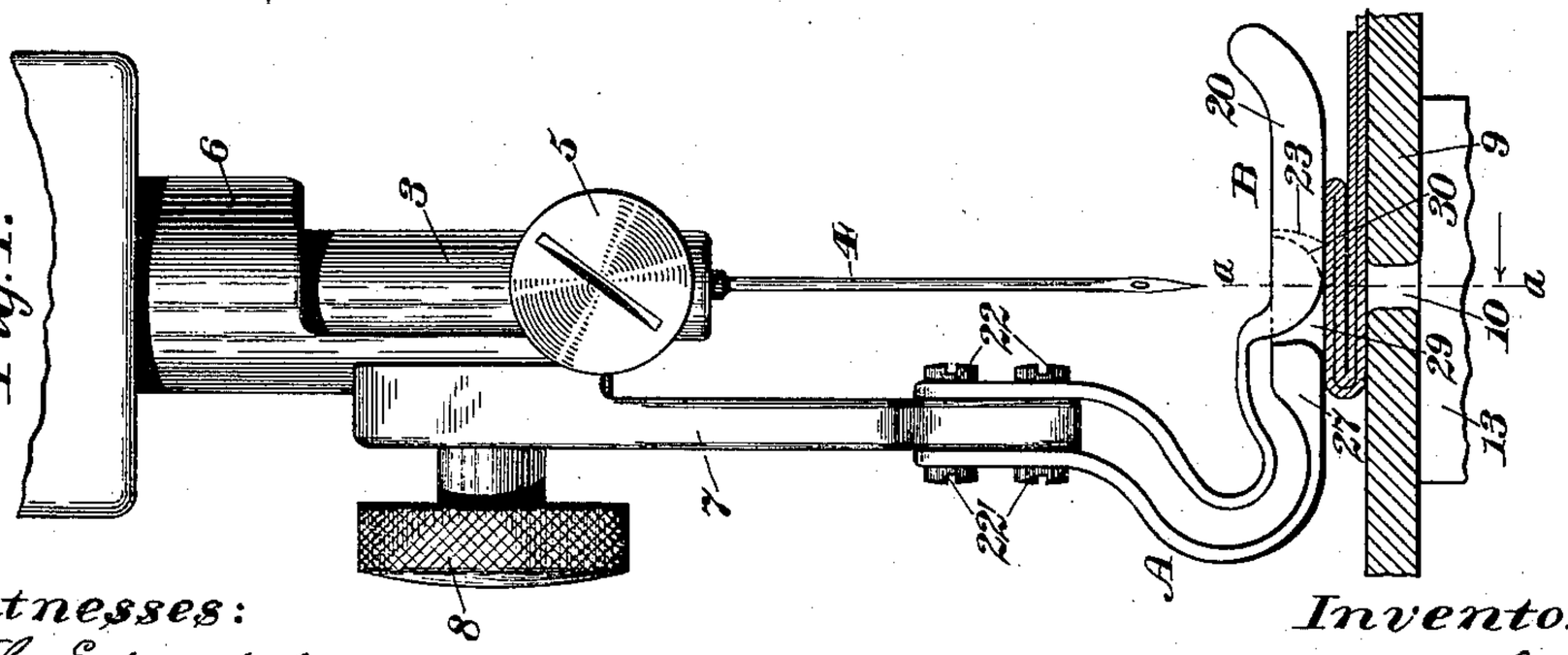


Fig. 2.

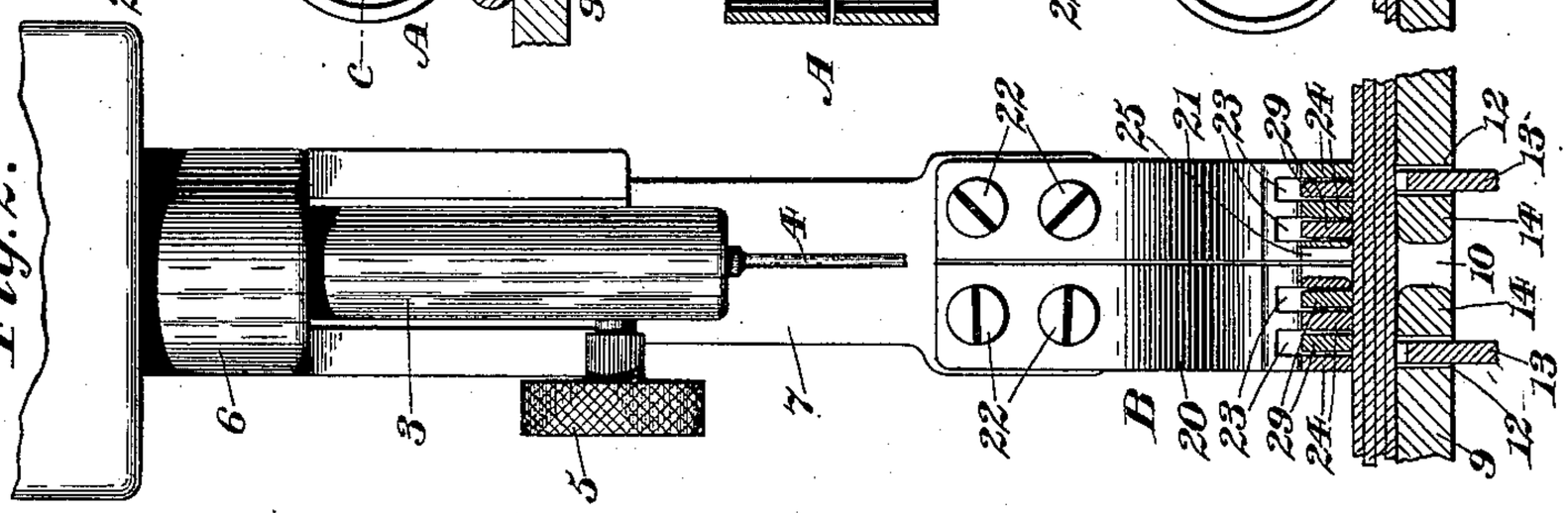


Fig. 3.

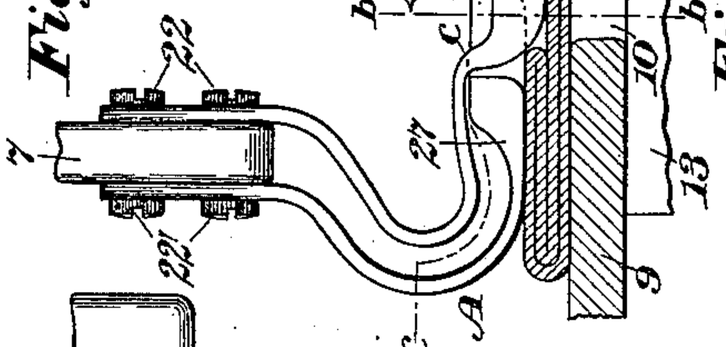


Fig. 4.

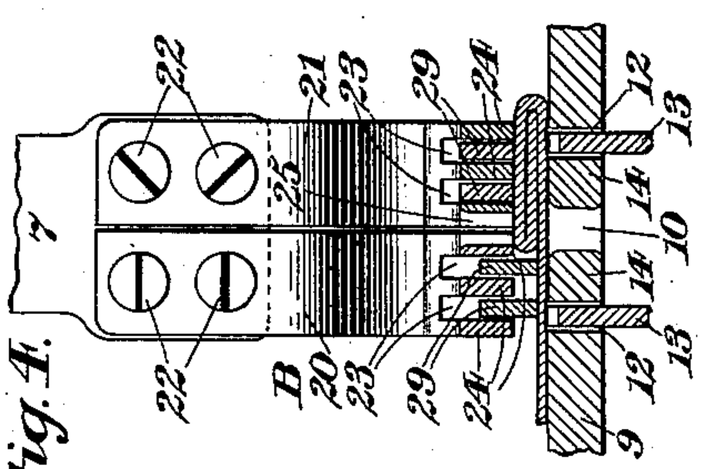


Fig. 5.

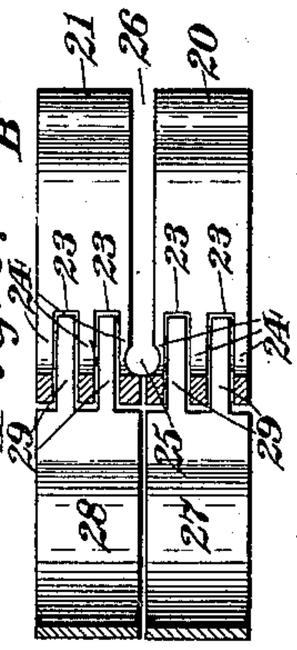


Fig. 6.

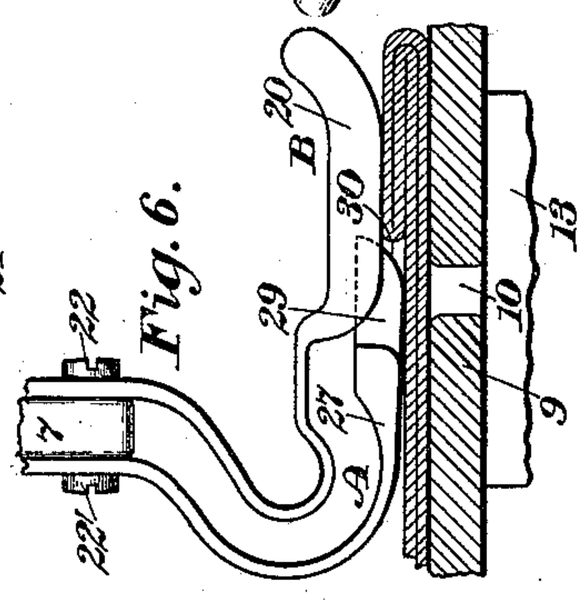
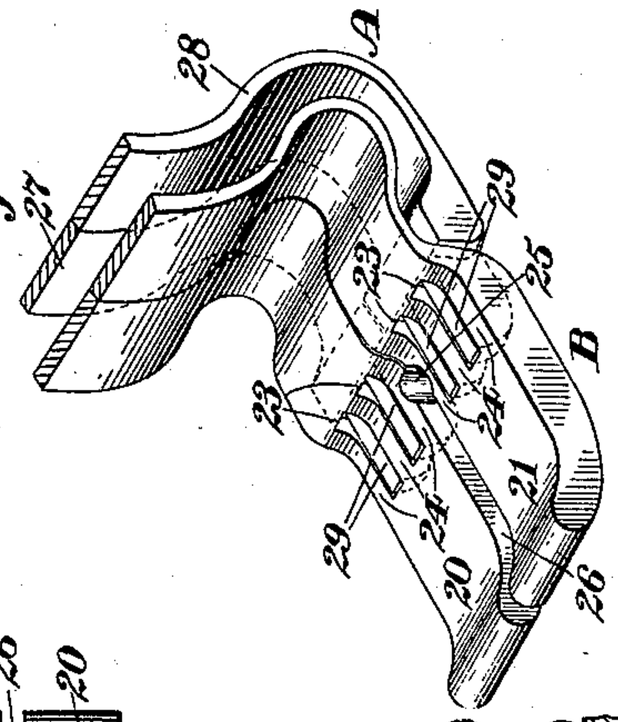


Fig. 7.



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UNITED STATES PATENT OFFICE.

HUBERT P. RICHARDS, OF NEW BRITAIN, CONNECTICUT.

PRESSER-FOOT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 601,402, dated March 29, 1898.

Application filed September 14, 1896. Serial No. 605,793. (No model.)

To all whom it may concern:

Be it known that I, HUBERT P. RICHARDS, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Presser-Feet for Sewing-Machines, of which the following is a specification.

This invention relates to presser-feet for sewing-machines, the object thereof being to provide an improved device of this character adapted to clamp fabric or work of different thicknesses and prevent the free or upward movement of the same as it is fed beneath the presser-foot.

In the drawings accompanying and forming part of this specification, Figure 1 is a side elevation of one form of this improved presser-foot secured in position on a needle-bar, said view also showing in section part of a throat-plate and a piece of fabric or work. Fig. 2 is a transverse sectional view of the presser-foot, taken in line *a a*, Fig. 1, and looking in the direction of the arrow, and thus showing a front view of the needle-bar and presser-foot bar. Fig. 3 is a similar view to Fig. 1, but showing the thickest part of the fabric in a different position relatively to the presser-foot from that shown in Figs. 1 and 2. Fig. 4 is a transverse sectional view taken on line *b b*, Fig. 3, and looking in the direction of the arrow, but with the thickest portion of the fabric in a different position. Fig. 5 is a horizontal sectional view of the presser-foot, taken in line *c c*, Fig. 3. Fig. 6 is a similar view to Figs. 1 and 3 for the purpose of illustrating a different position of the thickest portion of the fabric, and Fig. 7 is a perspective view of the presser-foot.

Similar characters designate like parts in all the figures of the drawings.

In practice it has been found in the use of the ordinary presser-foot, as fully set forth in my prior application for a patent, filed August 15, 1896, Serial No. 602,862, that when a piece of fabric or work of varying thickness is fed beneath the same it has no clamping action except on that part thereof having the greatest thickness, hence permitting the puckering of the work which the foot does not engage, and consequently resulting in the irregular feeding of the same. Moreover, in that class of machines in which it is necessary to form a loop during the inauguration of the upward movement of the needle, and which loop is formed by the friction of the thread with the fabric, which must remain immovable for this purpose, it has been found that not only is the loop frequently imperfectly formed, but oftentimes not formed at all, owing to the fact that while the presser-foot is clamping the comparatively thick portion of the material the relatively thin part thereof is free for movement, and hence on the upward movement of the needle its frictional engagement with the fabric is sufficient to carry the same upward, thus preventing the proper formation of a loop.

As a preface to a description of this improved presser-foot it is desired to state that it will be obvious on inspection of the device shown in the drawings that the construction of the same and the disposition of the members thereof could be varied in many ways—for instance, as hereinafter set forth—without departing from the scope of the invention, the gist of which resides in providing an improved presser-foot having its foot portion composed of two or more devices having independent clamping action, and each of which consists of one or more clamping members, preferably a plurality, whereby the presser-foot will comprise a series of independently-acting members operable together or independently of each other or with or independently of the action of the presser-foot as a whole to engage work of varying thicknesses and effectively prevent the upward movement of that part thereof between the feed-dogs.

The invention comprises two independent clamping means, (designated generally by A and B,) each of which is in the nature of main clamping means and to a certain extent constitutes in itself a presser-foot, and each of which main clamping means may consist of one member, but is herein shown comprising a plurality of clamping members so combined that the presser-foot as a whole includes a plurality of presser means or members each adapted to coact with or act independently of the others or adapted to coact with or act independently of the presser-foot as a whole to engage material of varying thicknesses and thoroughly clamp the same on the throat-

plate, whereby the free or upward movement of such material is positively prevented.

As this improved presser-foot may be used with various forms of sewing-machines, so much only of an ordinary sewing-machine as is necessary to illustrate the working of the device is herein shown, and it comprises a needle-bar 3, carrying the usual needle 4, secured thereto by a set-screw 5, a presser-foot-bar sleeve 6, encircling said needle-bar and which is in operative engagement in the usual manner with a spring (not shown) for clamping the presser-foot on the work in the ordinary way, a presser-foot bar proper, 7, secured thereto by a suitable fastening device, such as a thumb-screw 8, and which bar is herein shown as a relatively wide bar, whereby it is adapted to support the fabric-clamping means or presser-foot, hereinafter set forth, and a throat-plate 9, having the usual needle-aperture 10 and slots 12, the latter for the feed-dogs 13 of the feed mechanism, said slots forming the throat-plate bars 14.

It will be understood that the presser-foot-bar sleeve and the means for securing the same in position, as well as its actuating means, such as the lifting or cam lever and spring, may be of any desired form and construction, and hence it is not deemed necessary to illustrate the same, and especially as it is well known, so far as the spring is concerned, that all presser-feet have some means, preferably a spring, for securing the usual automatic action of the same in order to clamp the fabric on the throat-plate.

In the preferred form of presser-foot herein shown and described it comprises two independent main clamping means A and B, each in this construction preferably consisting of a pair of clamping members in the nature of springs. The front clamping means B is shown comprising a pair of flat springs 20 and 21, disposed edge to edge or side by side and secured at their upper ends to the front side of the presser-foot bar by any suitable fastening device—such as screws 22, passing through the shanks of said springs—and each being so bent that the foot or presser part thereof, which is preferably of greater thickness than its spring part, will be at an angle to the bar and in position to engage the fabric on its under side and have the required spring clamping action or pressure. The foot portion of each spring or member 20 and 21 in this construction has its rear end provided with a series of recesses or slots 23, (herein shown as two in number,) extending through and opening at the rear ends of said members, this being permitted by having the spring parts bent upwardly above the end of the foot parts thereof, and thereby forming a series of three longitudinal bars 24, so that the clamping means B has in this form of presser-foot a series of four recesses 23 and six longitudinally-extending members or bars 24, the inner adjacent two of which are cut away to form the needle-aperture 25 and presser-foot slot 26. The rear clamping means A in this construction is shown also comprising a pair of similar members or springs 27 and 28, secured in a similar way by like fastening devices 22′ to the rear side of the presser-foot bar and bent to form the foot portions, which are likewise of greater thickness than their spring parts and preferably are substantially of the same thickness throughout their major portions as the foot portions of the members 20 and 21, whereby when in their normal positions their upper and lower faces will be flush with the upper and lower faces, respectively, of said members 20 and 21. Each of these members has the front end of its foot portion recessed or slotted, and thus forked or bifurcated to form projections 29, (herein shown as two in number,) adapted to extend into the recesses 23 of the clamping members 20 and 21, and thus interlock and alternate with the bars 24 thereof, whereby the under faces of said projections 29 are in position to engage the work with and also independently of said clamping members 20 and 21 in a manner hereinafter set forth. In this construction of device the forward end 30 of each projection 29 is curved to permit the fabric to run under the same without impediment, the front wall of each recess 23 likewise being curved to permit the working of the projections 29 therein.

The outer sides of the members 20 and 27 and 21 and 28, respectively, are preferably in alinement with each other to thus present a neat-appearing presser-foot.

From the foregoing it will be seen that the under faces of the projections 29, together with the under faces of the clamping members 27 and 28, coact with the under faces of the clamping members 20 and 21 and their bars 24 to constitute the fabric-engaging face of the presser-foot.

In this form of presser-foot it will be observed that the length of the fabric-engaging part of each foot portion of the two main clamping means A and B is preferably substantially the same, so that when they are in position each will have an equal fabric-engaging face, and that the front part of the foot portion of the clamping means A interlocks with the rear part of the foot portion of the clamping means B, each, however, having an independent action.

It will be understood that instead of forming each main clamping means A and B of two members they might be formed of any desired number of members, wide or narrow, in proportion simply to the width of each and the desired width of the presser-foot, and that one clamping means A or B might be one integral structure, while the other might be of separate members, if desired, or that instead of forming each clamping means A and B of two members each may be constructed of one relatively wide member, whereby the presser-foot would simply comprise a pair of spring clamping means or members having a press-

ing action, owing to their construction, as well as a clamping action by means of the usual spring-pressed foot-bar.

From the foregoing it will be seen that in this preferred construction of presser-foot each spring member may act with or independently of its companion spring members and of the presser-foot as a whole, whereby a presser-foot is formed having a series of independent actions, one spring member at no time interfering with the action of its companion members, so that each clamping means has an independent action, and each clamping member of each clamping means also has an independent action—that is to say, each clamping means A and B not only work together in conjunction with the adjustment of the spring-pressed foot-bar, but also independently of each other and of such adjustment of said bar, and when composed of a series of members each of such members may act with or independently of all the others and with or independently of the adjustment of the presser-foot bar.

It will be also seen from the above that a pair of the longitudinal bars 24 of the foot portions of the clamping means B is adjacent to and side by side with the needle-aperture, whereby the fabric will be clamped adjacent to the needle at all times to thus firmly engage the same and prevent the movement thereof on the upward stroke of the needle.

In the use of this improved presser-foot with work of varying thicknesses it will be seen that when one of the main clamping means, as A or B, Figs. 3 and 6, is in engagement with the thickest part thereof the other main clamping means, as B or A, may be in engagement with the relatively thin part thereof, each having a pressure thereon by means of the mainspring on the presser-foot bar in the usual way, and also an independent pressure, owing to its own spring formation. When the thickest part of the fabric, as a hem or seam, is fed longitudinally with the presser-foot, Fig. 4, it will be observed that one or more, according to the number comprising the same, of the clamping members of one or both of the main clamping means A and B at one side of the longitudinal center of the presser-foot will engage the same, while the clamping members at the other side thereof are in engagement with the thin portion thereof, and when the thick portion is beneath all of the clamping members of both of said clamping means A and B they will assume the position shown in Figs. 1 and 2 and act precisely the same way as though the foot were formed solid throughout.

It will be understood that this improved presser-foot, like that described in my previous application above referred to, may be used with that class of machines having a series of needles, if desired, by simply providing the foot with a series of needle-apertures.

Having described my invention, I claim—

1. A spring-actuated presser-foot having a foot portion comprising yielding means adapted to act with or independently of the spring-actuated presser-foot as a whole and comprising a pair of clamping devices disposed one in front of the other and likewise adapted to act with or independently of each other, and each clamping device comprising a pair of clamping members disposed side by side and likewise adapted to act with or independently of each other.

2. A spring-actuated presser-foot having its foot portion comprising yielding means adapted to act with or independently of the spring-actuated presser-foot as a whole and comprising a plurality of clamping devices likewise adapted to act with or independently of each other, and each clamping device comprising a plurality of clamping members likewise adapted to act with or independently of each other.

3. A presser-foot consisting of a pair of independently-acting yielding devices disposed one in front of the other and having their bearing-faces normally in the same plane and in longitudinal alinement, and each having a shank by which it may be secured to the presser-bar.

4. A presser-foot consisting of a pair of independent clamping means disposed one in front of the other and having their bearing-faces normally in the same plane and in longitudinal alinement, each of said clamping means comprising one or more springs, having shanks adapted to be secured to the presser-bar.

5. A presser-foot comprising a presser-foot bar and a plurality of clamping means secured thereto and disposed one in front of the other to form the foot portion thereof, and each of said clamping means comprising a plurality of springs disposed side by side.

6. A presser-foot comprising a bar; fabric-clamping means secured to one side thereof and having a slot or recess; and fabric-clamping means also secured to the other side thereof and having a projection adapted to enter said slot or recess.

7. A presser-foot comprising a bar; a pair of spring members secured at one side thereof and disposed side by side and having slots or recesses; and a pair of spring members also secured at the other side of said bar and likewise disposed side by side and having a series of projections adapted to enter said slots or recesses.

8. A presser-foot comprising a spring-actuated presser-bar; fabric-clamping means secured at each side of said bar, respectively, and disposed one in front of the other, and each of said clamping means comprising a pair of spring members, the two front members thereof having a series of recesses or slots therein having curved front walls, and the two rear members thereof having a series of projections adapted to work in said slots and having the forward ends thereof curved.

9. A presser-foot comprising a spring-actu-

ated presser-bar; fabric-clamping means secured at each side thereof, respectively, and disposed one in front of the other and each comprising a flat spring having a foot portion, and both of said springs having slots or recesses thereby forming longitudinally-extending bars and projections interlocking with and alternately disposed relatively to each other, whereby one of said fabric-clamping means forms the rear portion and the other the front portion of the presser-foot.

10. A presser-foot comprising a series of clamping means secured one in front of the other and having interlocking portions whereby the under face of each is adapted to engage work of varying thicknesses.

11. A spring-actuated presser-foot having its foot portion comprising a series of clamping means secured one in front of the other and having interlocking portions, and each of said clamping means comprising a series of members disposed side by side.

12. A presser-foot comprising a presser-foot bar and a pair of flat springs secured thereto and disposed one in front of the other and having interlocking portions, thereby forming the foot portion thereof.

13. A presser-foot comprising a presser-foot bar, and a foot portion comprising a series of four flat springs disposed in pairs side by side and one pair in front of the other and interlocking with each other.

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