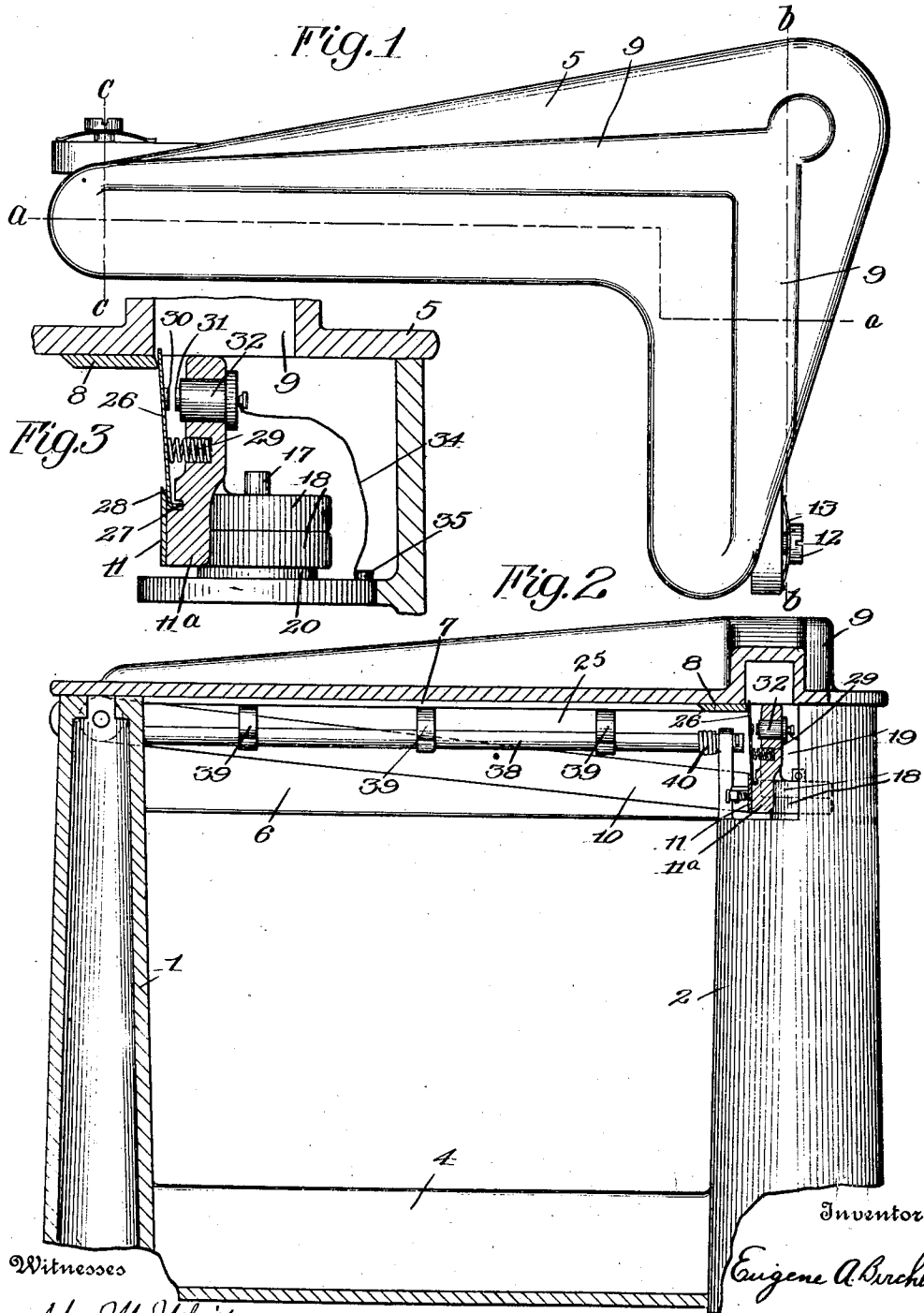


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MACHINE FOR OPENING ENVELOPS.
APPLICATION FILED MAR. 27, 1912.

1,197,788.

Patented Sept. 12, 1916.
2 SHEETS—SHEET 1.



Witnesses

Ada M. Whitmore.

L. M. Simms.

By

H. H. Simms

his Attorney

Inventor

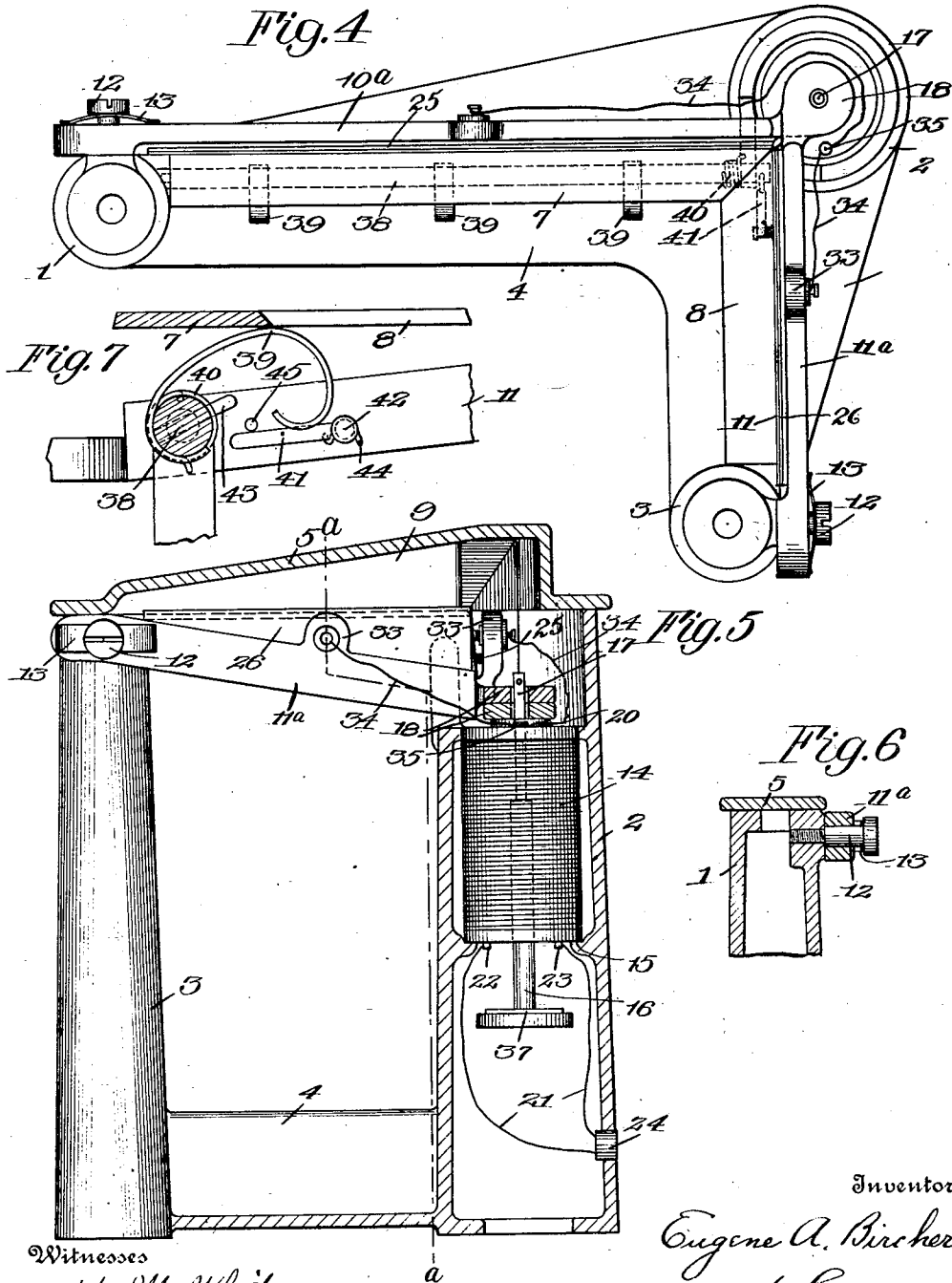
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UNITED STATES PATENT OFFICE.

EUGENE A. BIRCHER, OF ROCHESTER, NEW YORK, ASSIGNOR TO GEORGE A. COGSWELL AND HARRY C. NOBLES, OF ROCHESTER, NEW YORK, AND WILLIAM B. THURSTON, OF LIVONIA, NEW YORK.

MACHINE FOR OPENING ENVELOPS.

1,197,788.

Specification of Letters Patent. Patented Sept. 12, 1916.

Application filed March 27, 1912. Serial No. 886,576.

To all whom it may concern:

Be it known that I, EUGENE A. BIRCHER, of Rochester, in the county of Monroe and State of New York, have invented a new and useful Improvement in Machines for Opening Envelops, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

The present invention relates to machines for opening envelops and an object of the same is to provide a motor-operated cutter which may be manufactured at a very small expense.

Another object of the invention is to provide a construction in which the cutter operating motor is only brought into operation when an envelop is presented to the cutter.

Another object of the invention is to provide a gage for determining the amount to be removed from the envelop, said gage being adapted to control the operation of the motor.

Still another object of the invention is to provide an envelop opener which will operate simultaneously upon two sides of an envelop at right angles to each other.

A further object of the invention is to improve the general construction of envelop openers, in order to secure simplicity and lightness of structure.

A still further object of the invention is to provide a work support for envelop openers constructed to discharge the work or envelop after each cutting operation, thus permitting the user of the machine to make ready for the cutting of another envelop.

To these and other ends the invention consists in certain parts and combinations of parts all of which will be hereinafter described, the novel features being pointed out in the appended claims.

Figure 1 is a top view of an envelop opener constructed in accordance with this invention; Fig. 2 is a section on the lines *a-a* Fig. 1 and Fig. 5; Fig. 3 is an enlarged detailed section of the cutter gage and co-operating parts; Fig. 4 is a top view of the envelop opener with the cover member removed; Fig. 5 is a section on the line *b-b* Fig. 1; Fig. 6 is a section on the line *c-c* Fig. 1; and Fig. 7 is a detail view of the envelop support and its actuating devices.

In the illustrated embodiment of this invention there is employed a frame com-

prising, in this instance, three hollow posts indicated at 1, 2 and 3 respectively and connected at their bottoms by base pieces 4. Supported on the posts is a cover plate or member 5 which may have depending flanges 6 between the posts on the rear side of the frame. Upon the under side of the cover plate may also be arranged stationary cutters 7 and 8 positioned preferably at right angles to each other, the plate having two pockets 9 to one side of the knives or cutters tapering toward the posts 1 and 3 from the post 2 where they merge into each other.

Adapted to coöperate with the stationary or fixed cutters 7 and 8 are movable cutters 10 and 11 which may be arranged on carriers 10^a and 11^a pivoted, in this instance, respectively to the rear sides of the posts 1 and 3 and movable upwardly to effect such co-operation. The pivoting may be effected by boring each post 1 and 3 and connecting to each a headed pivot 12, each cutter-carrier turning on one of these pivots and being held against free play thereon by a leaf spring 13 located between the head of the pivot and the cutter carrier.

Any suitable means may be employed for operating the movable cutters and their carriers but it is preferred to have the cutters driven by a motor which periodically operates the cutters whenever an envelop is presented to such cutters. In this instance, the motor is in the form of a solenoid comprising a coil 14 arranged vertically within the hollow post 2 upon an annular seat 15 and having a core 16 operating vertically therein, said core having a non-magnetic extension 17 at its upper end connected with the two cutters. Preferably each cutter carrier has a flattened eye 18 at its free or swinging end operating within the post 2 above the coil 14, the post being cut away at 19 above the solenoid to permit the cutter carriers to extend therein. The non-magnetic or copper extension 17 passes through the eyes 18 and has a rigid disk 20 below the eyes for coöperating with the under eye and with the top of the solenoid coil for the purpose of elevating the cutters when the core 16 is elevated and also for limiting the downward movement of the core 16. The coil has line conductors 21 connected thereto, one of which is connected to the terminal 22 and the other of which is connected to the termi-

nal 23 of the solenoid. The conductors lead through an insulating bushing 24 in the post 2 to any suitable source.

A controlling means for the solenoid or motor is, in this instance, either one or both of the gages 25 and 26, which are mounted upon the carriers 10^a and 11^a, respectively, each being pivoted to its carrier by providing a flanged portion 27 turned inwardly along the lower edge of each gage and seated loosely within an L-shaped pocket which is closed by the proximate knife or cutter 10 and 11 so that said knife or cutter serves also to retain its gage. The upper edge of each gage lies or projects into one of the pockets 9 and coöperates with the inner or rear face of one of the stationary cutters 7 and 8 which serves to limit the outward movement of the gage under the action of its spring 29. The pivoted or swinging movement of the gages is utilized for controlling the motor or solenoid 14 and to this end a contact or terminal 30 is arranged upon the rear face of each gage to coöperate with a contact or terminal 31 arranged within an insulating bushing 32, which is supported by a projection 33 on the proximate knife carrier 10^a or 11^a. From each of the terminals 31, a conductor 34 leads to connect with a common terminal 35 on the solenoid. It is apparent that the gages 25 and 26, together with the knife carriers 10^a and 11^a and the frame of the machine, serve as conductors for establishing a circuit from either of the terminals 30 on the gages to the terminal 36 of the solenoid which, in this instance, is the upper head of the solenoid coil, so that, when either of the sets of terminals 30 and 31 are in coöperation, a circuit will be established by way of one of the conductors 21, coil 14, one of the conductors 34, contacts 31 and 30, gage 25 or 26, the frame of the machine, terminal 36, coil 14, and conductor 21, which will energize coil 14, elevate the core 16 and cause the proximate ends of the knife carriers 10^a and 11^a to be elevated, thus effecting coöperation between the movable cutters 10 and 11 and the stationary cutters 7 and 8, the amount of material to be removed being determined by the movable gages 25 and 26.

Another controlling device for motor or solenoid may be brought into operation after the envelop has been cut, in order that the cutters may make their movements. In this instance, the solenoid is deenergized when the cutters have completed their cutting movements. Preferably, this is effected by short circuiting the solenoid and, to this end, a conductor 37 is carried by the lower end of the solenoid core 16 in a position to connect the terminals 22 and 23 when the solenoid core is elevated to its extreme position.

Another feature of this invention is the provision of a clamp or work support which

holds an envelop firmly until it has been opened after which the support moves or tilts to release automatically said envelop and drop it by gravity so that it is possible to handle another envelop for presentation to the machine, while the machine is operating upon the envelop previously fed thereto. In this instance, the clamp or work support consists of a rock shaft 38 journaled at its ends in the posts 1 and 2 and carrying between its ends a number of gripping or supporting devices 39 which preferably are in the form of curved fingers or arms made of resilient material and coöperating with the stationary cutter 7 beneath which the shaft 38 is located, the fingers projecting beyond the forward edges of the cutter 7 and being turned downwardly in order to facilitate the introduction of the envelop between the gripping fingers and the cutter 7, and the envelop being pressed downwardly upon the projecting portions of the fingers and pushed rearwardly. A coil spring 40 may surround the shaft 38 at one end thereof, being secured to the shaft and to a fixed part, in order that the shaft may have a normal tendency to turn in a direction to press the gripping fingers against the stationary cutter 7. This arrangement permits the clamp to yield to envelops of different thicknesses.

To cause the envelops to be released after each cutting operation, devices may be provided for shifting the support on the lowering of the cutters. To this end, a dog 41, (see Fig. 7), pivoted at 42 to the front face of the knife 11, coöperates at its free end with an arm 43 extended forwardly from the shaft 38. A spring 44 normally holds the dog 41 against a stop 45 so that, on the downward movement of the cutter 11, the dog 41 engages the arm 43 and depresses the fingers 39 from engagement with the cutter 7, whereas on the upward movement of the cutter 11, the dog 41 yields and passes above the arm 43 without actuating the latter.

In the use of the invention, an envelop is introduced above the fingers 39 and is shifted to engage either or both of the gages 26, thus establishing a circuit which energizes the coil 14 and causes the knives or cutters 10 and 11 to be elevated until the contact 37 bridges the space between the terminals 22 and 23, when the coil 14 will be deenergized. This causes the lowering of the cutters 10 and 11 whereupon the pawl or dog 41 will engage the arm 43 and swing the gripping devices 39 downward slipping off such arm after a certain position has been reached. With the downward swinging of the gripping or supporting devices 39, the envelop will drop by gravity so that the user of the machine, after he has once placed an envelop in position to be cut, may let go of

the same and make ready to present another envelop to the machine.

An envelop opener constructed in accordance with this invention provides a motor driven device which may be manufactured at small cost. The motor is of the most simple construction, only consuming energy when an envelop is presented thereto so that the expense of running the machine is reduced to a minimum. The machine is constructed to operate upon two edges of an envelop at right angles to each other and a single operating means controls both of the cutters for producing the above results. The work support firmly holds an envelop during the cutting operation and finally frees such envelop to discharge the same by gravity.

What I claim as my invention and desire to secure by Letters Patent is:

1. In an envelop opener, the combination with a movable cutter, and a solenoid for actuating the cutter, of a controller for the solenoid circuit located in position to be engaged by an envelop when presented to the cutter.

2. In an envelop opener, the combination with a cutter, of an electro-magnetic device connected to the cutter, and two controllers for the circuit of said device, one located to be actuated by the envelop when presented to the cutter and one located to be actuated by the electromagnetic device to deenergize the latter after the cutter has been actuated.

3. In an envelop opener, the combination with a cutter, and solenoid connected to the cutter, of a controller for the solenoid circuit located in position to be engaged by an envelop when presented to the cutter.

4. In an envelop opener, the combination with a reciprocating cutter and a solenoid connected thereto, of a controller for the solenoid to cause the latter to operate the cutter when a letter is presented to the cutter, and a controller for the solenoid actuated by the latter to deenergize the same after the envelop has been cut.

5. In an envelop opener, the combination with a reciprocating cutter, and a reciprocating electro-magnetic device connected to the cutter, of an envelop gage, and a controller actuated by said gage to energize the electro-magnetic device.

6. In an envelop opener, the combination with a reciprocating cutter, and a reciprocating electro-magnetic device connected to the cutter, of a gage, and a controller actuated by said gage to energize the electro-magnetic device, and a controller actuated by said electro-magnetic device when the latter has actuated the shutter to deenergize such device.

7. In an envelop opener, the combination with a movable cutter, and a motor for operating the same, of a gage movably mounted on the cutter and controlling the motor.

8. In an envelop opener, the combination with a reciprocating cutter and a motor for operating the same, of a gage pivotally mounted on said cutter and adapted to control the motor.

9. In an envelop opener, the combination with a fixed cutter and a movable cutter for cooperating with the fixed cutter, of a motor for operating the movable cutter, and a gage movably mounted on the movable cutter and controlling the motor.

10. In an envelop opener, the combination with a pair of posts, and a straight edge knife supported by said posts, of means for clamping an envelop against the under face of the knife so that an edge of the envelop can project beyond the cutting edge of the knife, a gage for cooperating with an edge of the envelop to determine the projection thereof beyond the cutting edge, and a knife movable upwardly relatively to the clamping means for cooperation with the stationary knife to remove the projecting edge.

11. In an envelop opener, the combination with a pair of posts, of a stationary knife supported by the posts, yielding means for clamping the envelop against the knife, and a knife movable upwardly relatively to the clamping means to cooperate with the stationary knife for opening the envelop.

12. In an envelop opener, the combination with a horizontally supported stationary knife, of yielding means for clamping an envelop against the under side of the knife, and a movable knife supported below the stationary knife and movable upwardly relatively to the clamping means to cooperate with the stationary knife in order to open an envelop.

13. In an envelop opener, the combination with a stationary straight edge knife, of a support arranged to hold an envelop against the knife with one edge projecting beyond the knife, said support being movable to discharge the envelop after the cutting operation, a gage for determining the amount to be removed from the edge of the envelop and a cutter movable upwardly relatively to the support to cooperate with the stationary knife in order to remove the edge from the envelop.

14. In an envelop opener, the combination with a stationary straight-edge knife, of a support arranged below the knife to hold the work against said knife, said support being arranged to tilt about an axis extending longitudinally of the knife, and a movable cutter for cooperation with the stationary knife to remove an edge from the envelop, said cutter being movable relatively to the support.

15. In combination with a cutting mechanism embodying a stationary and a movable cutter, a work support movable relatively to

the movable cutter to hold the work in position relatively to the stationary cutter and movable to discharge the work by gravity.

16. In an envelop opener, the combination
5 with a pair of posts, a cover supported on the posts and having a stationary knife on the under side thereof, and means for holding the envelops against the stationary knife, of a cutter pivoted to one of the posts
10 beneath the cover plate, and operating means for the cutter on the other post.

17. In an envelop opener, the combination with a pair of posts, one of which is hollow, of a cover supported by the posts and
15 carrying a stationary knife on the under side thereof, a cutter pivoted to one of the posts, and operating means for the knife located in the hollow post.

18. In an envelop opener, the combination
20 with a pair of posts, of a cover member supported by the posts and having a pocket in the under side thereof, a stationary knife supported on the under side of the cover to one side of the pocket, and a cutter pivoted to one of the posts to cooperate with the
25 stationary cutter and operate in the pocket.

19. In an envelop opener, the combination with a stationary straight-edge cutter, of an envelop support for holding the envelop beneath the stationary cutter, said support sustaining the work during the cutting operation, a gage for determining the amount to be removed from the edge of the envelop,
30 spring means tending to hold said support with yielding pressure against an envelop
35 arranged in operative relation to the stationary cutter, and means for moving the support away from the stationary cutter to discharge the envelop by gravity when the
40 movable cutter moves away from the stationary cutter.

20. In an envelop opener, the combination with a movable cutter, and a stationary cutter arranged above the movable cutter, of
45 an envelop support for holding work to the stationary cutter, spring means tending to cause such support to hold an envelop, and means for moving the support to discharge the envelop by gravity when the cutter
50 moves away from the stationary cutter.

21. In an envelop opener, having in combination a cutting means embodying a stationary and movable cutter, said cutters having straight cutting edges, a tiltable
55 work-support mounted to turn about an axis

extending in the direction of the length of the cutters to hold an envelop in position, and automatic means for tilting the work support after each cutting operation to discharge the work by gravity.

22. In an envelop opener, the combination with a cutting means, of a movable work support for holding the work in a position to be operated upon by the cutting means, spring means tending to hold the work support in supporting position, and means operated by the cutting means for moving the work support after each cutting operation to discharge the work by gravity.

23. In an envelop opener, the combination with a cutting mechanism embodying a stationary and a movable cutter, of a tiltable work support arranged to hold the work against the stationary cutter, a spring for holding said support in supporting position, and means actuated by the movable cutter for shifting said support to discharge the work by gravity.

24. In an envelop opener, the combination with a cutting mechanism embodying two cooperating straight-edge cutters, of a work support for holding the work in position to be operated upon by the cutting mechanism, said work support being mounted to turn about a horizontal axis in order to discharge the work by gravity, a device for holding said support in supporting position, and a trip device actuated with a cutting mechanism to cause the work support to discharge its work after the cutting operation.

25. The combination with a plate, of a rock shaft having spring arms thereon to hold work against the under side of the plate, cutting means for operation on work held between the arms and the plate, and means for rocking said shaft to release the work.

26. The combination with a plate, of a rock shaft having spring arms thereon to hold work against the under side of the plate, a spring acting to turn the shaft to hold the arms in cooperation with the plate, cutting means for operation on work on the work support, and automatic means for rocking the rock shaft to discharge the work after each cutting operation.

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