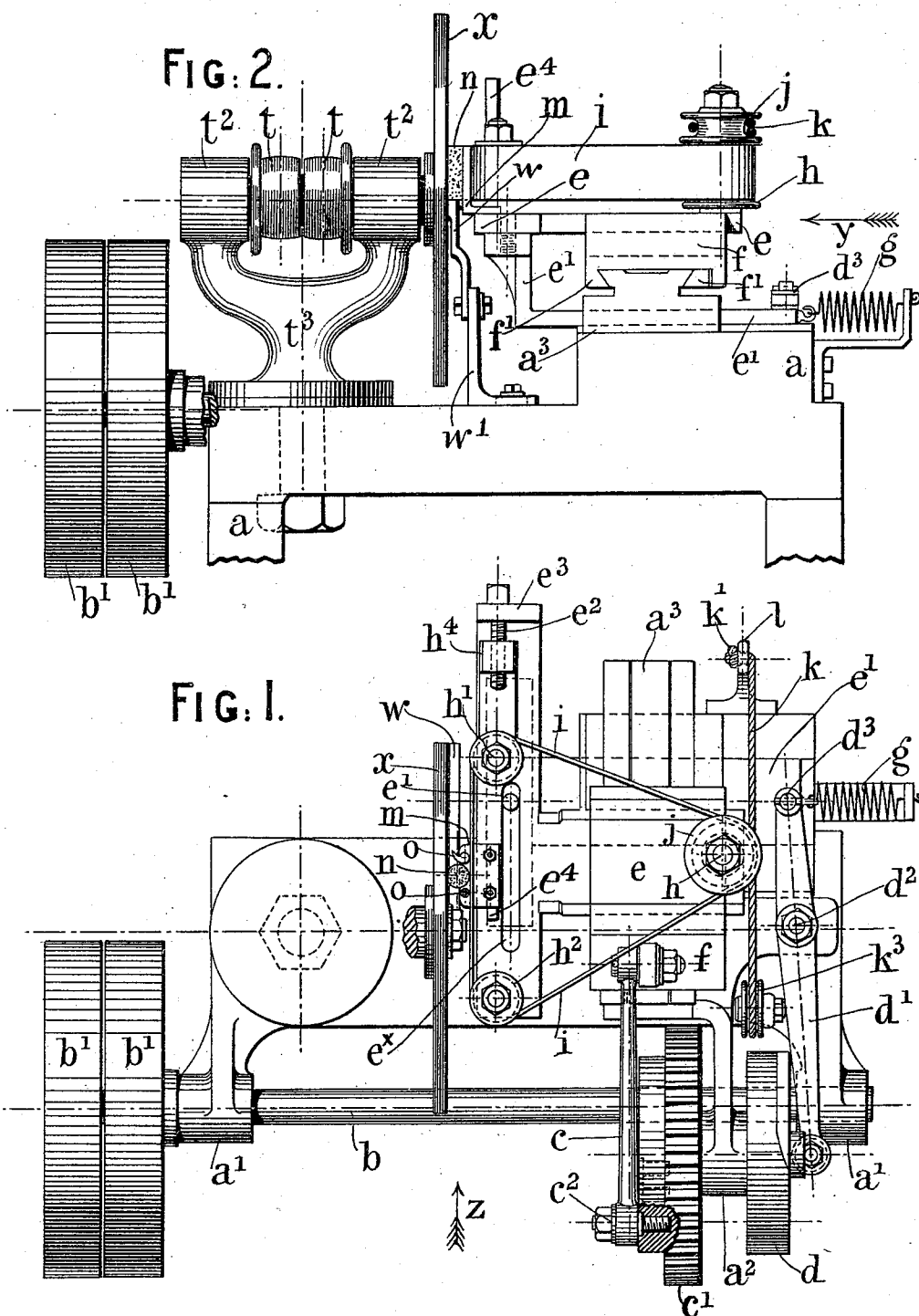


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No. 530,845.

Patented Dec. 11, 1894.



WITNESSES.
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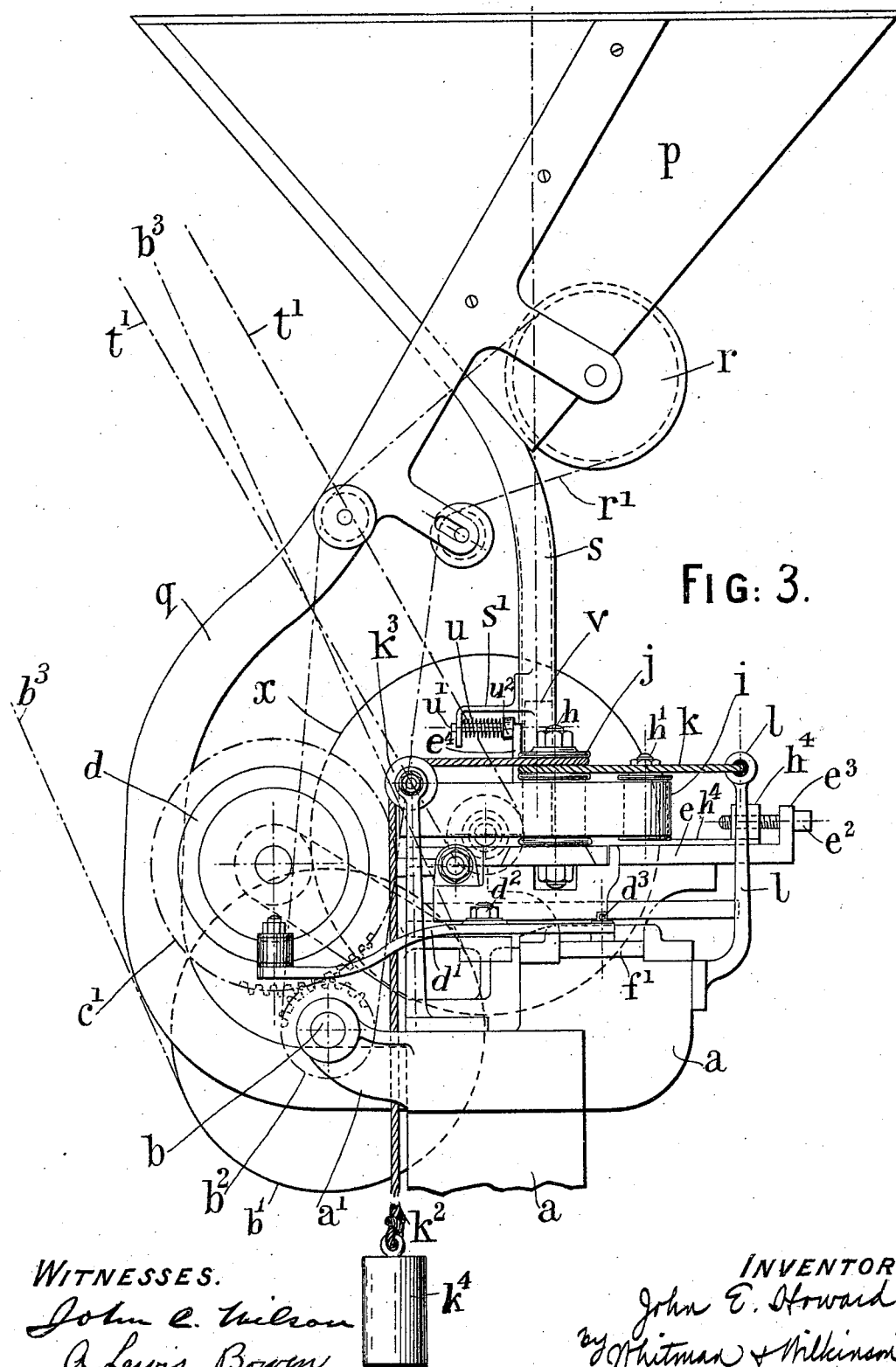
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UNITED STATES PATENT OFFICE.

JOHN E. HOWARD, OF LONDON, ENGLAND, ASSIGNOR TO THE CORK COMPANY, LIMITED, OF SAME PLACE.

MACHINERY FOR FINISHING, POLISHING, OR SURFACING CORKS.

SPECIFICATION forming part of Letters Patent No. 530,845, dated December 11, 1894.

Application filed February 6, 1894. Serial No. 499,297. (No model.) Patented in England July 6, 1893, No. 13,225.

To all whom it may concern:

Be it known that I, JOHN EISENHARDT HOWARD, manufacturer, a subject of the Queen of Great Britain, residing at 73 Minories, London, E. England, have invented Machinery for Finishing, Polishing, or Surfacing Corks, (for which I have obtained a patent in Great Britain, numbered 13,225, and dated July 6, 1893,) of which the following is a specification.

This invention relates to the manufacture of corks and consists of machinery or apparatus for finishing, polishing, smoothing, cleaning or otherwise surfacing the cork by grinding and an especial object of my present invention is to produce a machine or apparatus which will automatically adapt itself to varying sizes and shapes of the corks to be treated according to my invention—so that a quantity of corks to be surfaced of various sizes and shapes may be placed into a hopper and thence fed to the machine which will receive and hold each cork successively and present same to the abrading surface and give the required amount of grinding to the surface of each such cork irrespective of its size or shape that is to say a large cork may be succeeded by a smaller one and a round cork succeeded by an oval or other shaped cork and all alike will successively receive the required amount of grinding to finish, polish or surface, &c., same.

My present invention is as follows: On a suitable frame or support I arrange and mount a suitable abrading surface—advantageously a grinding disk revolving in a vertical plane—capable of being revolved by a driving band and fast and loose pulleys or in other suitable manner and also may be capable of being adjusted in any direction required—all of which is well known and understood. In close proximity to this abrading surface I arrange and mount a movable table, platform or support (which for the sake of brevity I shall hereinafter refer to as the “platform”) which has a double movement imparted thereto in a horizontal or other direction, viz: a reciprocating movement parallel or thereabout to the grinding surface and a second movement toward and away from the said grinding surface as hereinafter explained. This double movement may be obtained by arranging and mounting said platform after the manner of

the well known slide rest for lathes or in any other suitable manner. For instance the said double movements may be imparted to the said platform by means of a crank or equivalent on a slowly revolving shaft (the latter at right angles to the plane of the abrading disk) actuating a crank arm or rod suitably attached to a slide carrying the said platform and thus imparting to said platform a movement parallel (or thereabout) to the abrading surface while a cam or cams (or equivalent—on the said crank shaft—or otherwise suitably mounted) when the said platform has been moved (by the said crank) to the position farthest from the center of the grinding disk—will cause the said platform to bodily recede away from the said grinding disk and then the said crank moves back the platform to its position nearest to the center of said disk and then the cam (or a second cam or a spring or equivalent) causes the platform to again approach toward the grinding disk and the operation is repeated and so on, or the requisite double motion may be imparted to the said platform in any other equivalent or suitable manner. Upon this said platform (to which this movement in two directions is imparted) I arrange and mount the means adapted to hold and rotate each piece of cork in turn against the abrading surface and drop same when finished as will be hereinafter fully explained.

In order that my present invention may be easily understood and readily carried into practice I will proceed to fully describe same with reference to the drawings hereunto annexed.

Figure 1 is a plan of the machine with the cork feeding device and hopper removed. Fig. 2 is a side view of the machine—looking in the direction of the arrow *z* Fig. 1 but omitting the driving shaft and crank arm and cam, &c., thereon. Fig. 3 is a front view of the machine looking in the direction of the arrow *y* Fig. 2 and showing the cork hopper and feeding appliance in position.

Similar letters of reference indicate corresponding parts throughout.

a is the standard or frame supporting the whole machine.

b' b' are “fast and loose” pulleys on the

main driving shaft b —this latter being journaled in brackets a' or otherwise suitably carried in or on the main frame a .

A small toothed wheel b^2 (Fig. 3) on shaft b gears with the large toothed wheel c' this latter being fixed on an axle journaled in the bracket or bearing a^2 carried by the main frame a said axle also having rigidly fixed thereon the cam faced wheel d (or this cam surface d may be fixed and immovable) as hereinafter explained. The aforesaid toothed wheel c' carries a crank pin c^2 thereon by means of which reciprocating motion is imparted to the crank arm or connecting rod c which at its other end is suitably connected to the slide f carrying the sliding platform e . This pin c^2 is adjustably attached to c' so that said pin c^2 may be fixed at a greater or less distance from the center of c' and thereby impart more or less travel to f through the rod c . The said slide or support f of the platform e is formed of a dovetail form at f' f' which fits and slides upon the corresponding dovetail bed or guide a^3 fixed to or forming part of the main frame a . Besides the reciprocating motion thus imparted to the slide f (carrying the platform e) in a parallel or approximately parallel direction to the plane of the abrading disk x the platform e is carried in a transverse slideway in the upper part of the aforesaid support f (after the manner of the well-known slide rests for lathes) so that a reciprocating motion toward and away from the face of said disk x can be imparted to said platform e by means of the cam d and cam arm d' pivoted at d^2 to the main frame a and which by its end d^3 (pivoted to the arm e' fixed to the said platform e see Fig. 2) pushes in the platform e (by the action of the cam d) toward the grinding disk x against the action of the spring g which normally keeps the said platform e drawn out from the grinding disk x . The said arm e' (to which the cam lever d' is pivoted at d^3) passes through a guideway formed for same transversely through a^3 and then rises vertically and passes through or into a slot e^* (see Fig. 1) so that the platform e can move parallel to the face of disk x upon the upper end of e' the latter having no such parallel motion but only movement toward and away from the grinding disk x . Upon this platform e three (or other suitable number of) vertically disposed rollers h h' h^2 are mounted upon vertical axles or bearings upon which they can each and all independently rotate. The roller h' is mounted upon a small independent slide h^4 which is adjustable upon the platform e (sliding in suitable guideways provided for this purpose) by means of the tension screw e^2 carried in and free to revolve in the arm or lug e^3 on the platform e . Thus the roller h' can be adjusted and held at a greater or less distance from the rollers h and h^2 and consequently any required degree of

tension can be given to the belt i horizontally disposed around said rollers h h' and h^2 .

The roller h has fixed to the upper part thereof (clear of the belt i) a grooved wheel or pulley j in which operates a rope, cord, belt, chain or equivalent k and which for the sake of brevity I shall hereinafter refer to as the "rope k ." This rope k is passed once or more round the pulley j and the one end k' of such rope k is attached to the bracket l which latter is rigidly fixed to the main frame a , see Fig. 3, while the other or free end of said rope k is passed over a guide pulley k^3 Fig. 3 and at its end k^2 carries a weight k^4 or is otherwise suitably held so that when the platform e in the slide f is drawn backward and forward by the crank arm c parallel to the face of the abrading disk x thereby the pulley j has to pass along the rope k and consequently is thereby rotated backward and forward as the platform e is caused to travel as described. The rotary motion thus imparted to the pulley j is communicated to the roller h and thereby the belt i is carried round for the purpose of rotating the cork as hereinafter explained. This arrangement of the rope k allows for the motion of the platform carrying roller h and pulley j thereon toward and away from the disk x and furthermore by changing the pulley j for another pulley of larger or smaller size thereby I can diminish or increase the speed of travel imparted to belt i .

m is a ledge projecting from e just beneath the bottom edge of the flexible band i and this ledge m carries on top thereof two vertical pins or idle rollers o which act as retaining pins or guards to retain the cork on the rest during grinding, (i. e. surfacing, &c.)

w is the rest (carried on a bracket w' fixed to the main frame a) upon which the cork is slid along while being rotated against the abrading disk x . This rest w is capable of vertical as well as horizontal adjustment.

p is the hopper or reservoir above the machine carried on the supporting arm q fixed to the main frame a .

r is an "agitator" wheel part of which operates within the converging bottom part of the hopper p to keep the corks therein continuously fed endwise down the channel s leading to the point where they are deposited one by one from said channel s on the rest w between the vertical guide rollers o o as hereinafter explained. (See Fig. 3).

The "agitator" wheel r is driven by an endless belt or band r' which in its turn passes round a pulley fixed on the main driving axle b . See Fig. 3.

t t are fast and loose pulleys on the axle shaft to which the abrading disk x is fixed, these pulleys t t being driven by the traveling belt t' from any convenient source of power. These pulleys t t and axle carrying the abrading disk x are mounted in a bear-

ing formed in the forked arms² of the swiveling support³ mounted upon the main frame *a* (see Fig. 2) so as to be capable of swiveling adjustment thereon in any well-known or suitable manner as is well understood.

The fast and loose pulleys *b'* on the axle *b* are driven by a separate belt *b³* also from any suitable source of power.

s' is a bracket fixed on the exterior of the cork guide channel *s* and carrying a spring *u* which latter normally forces the retaining arm or catch *u'* within the passage way in the guide channel *s* so as to thereby retain the bottom-most cork *v* in said passage *s*. At the moment it is desired to drop the next cork onto the rest *w* a projecting arm *e⁴* on the platform *e* strikes a projecting pin *u²* on the pin *u'* and by the movement of the said platform presses back the spring *u* and arm *u'* and so releases the bottom cork in the guide *s* and the whole series of corks drops down the channel *s* until the lowermost cork is resting on the rest *w*. The movement of the platform *e* now releases the spring *u* which thereupon pushes the retaining arm *u'* against the bottom-most cork *v* in the channel *s* and thereby holds same and prevents any more corks dropping down while the cork *n* thus deposited on the rest *w* is moved away and presented against the abrading disk *x* as explained.

The operation is as follows:—The ready-shaped corks to be polished, finished or otherwise surfaced (and which need not be of exactly the same gage or shape) are placed in large numbers in the hopper *p*. The "agitator" wheel *r* keeps these stirred up so that said corks are continuously fed endwise down the guide channel *s* to the point where said channel *s* terminates just above the top edge of the flexible belt *i* where the bottom-most cork *v* in the channel *s* is retained in position by the spring arm *u'* as already explained. This spring arm is pressed back—as before explained—and the bottom-most cork deposited on the rest *w*. This spring arm *u'* is then released and further corks are thereby prevented from dropping out. The action of the cam *d* against the spring *g* now moves the platform *e* toward the abrading disk *x* so that the flexible band *i* presses the cork *n* against the abrading disk *x*. Next the motion of the crank pin *c²* (Fig. 1) now causes the platform *e* to travel in a parallel direction across the face of the abrading disk *x* with the cork *n* in contact therewith and retained on the rest *w* by the uprights *o o* as before explained. Immediately the crank rod *c* begins to move the slide *f* carrying the platform *e* parallel with the face of the abrading disk *x* thereupon the rope *k* imparts rotary motion through the pulley *j* and roller *h* to the belt *i* which latter being in frictional contact with the vertically disposed cork *n* thereby imparts rotary motion to the said cork *n* which is thus caused to rotate upon its own axis

while presented to the abrading disk *x* (which abrading disk may have varying degrees of fineness of abrading material circularly arranged on its face) so that as the cork is thus rotated against and moved across its face it will be abraded and thus very perfectly finish, polish or surface the said cork. The direction of travel of the abrading disk is from the top of the cork downward so that the tendency of the abrading disk *x* is to keep said cork down upon its rest *w*. The parallel motion of the platform *e* may be continued until the cork *n* is clear of the outer edge of the abrading disk *x* whereupon the finished cork drops into a suitable receptacle to receive same (not shown) or if desired the cam *d* and spring *g* may be arranged to begin to draw back the platform *e* before the cork *n* reaches the outer edge of *x* whereupon the finished cork *n* is dropped into a suitable receptacle. The crank arm *c* then draws the slide *f* carrying the platform *e* back in a parallel direction across the disk *x* and the cam *d* through its connections *d'* *d²* *d³* then moves same again toward the abrading disk *x* whereupon the next cork to be ground is delivered on the rest *w* as before described and the operation is repeated—and so on.

It will be obvious that many of the parts and details of the machine and means of actuating same may be varied without departing from the true nature of my invention—the essential feature of which is the traveling flexible holding band *i* adapted not only to thereby rotate the cork while being polished, &c., but also adapting itself to varying sizes and shapes of the corks to be finished and has many other advantages especially the simplicity of the construction of the machine, its automatic operation and large output from each machine.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a machine for finishing, polishing, or surfacing corks by grinding, the combination with an abrading surface; of a platform movable toward and away from said abrading surface, and means for moving said platform; and a flexible cork holder mounted on said platform and consisting essentially of an endless traveling band adapted to hold corks of various shapes and sizes against the abrading surface, and to rotate the cork while in said position, substantially as described.

2. In a machine for finishing polishing or surfacing corks by grinding—the combination with an abrading surface of a platform adapted to travel across the face of said abrading surface and a flexible cork holder consisting of an endless traveling band vertically disposed and traveling in a horizontal plane round and the vertical supporting rollers carried on said platform.

3. In a machine for finishing polishing or surfacing corks by grinding—the combina-

tion with an abrading surface of a platform adapted to travel across the face of said abrading surface an endless traveling band vertically disposed to travel in a horizontal plane
 5 around its vertical supporting rollers on said platform to form a flexible cork holder and means to adjust the tension of said endless band.

4. In a machine for finishing polishing or
 10 surfacing corks by grinding—the combination with an abrading surface of a platform adapted to travel across the face of said abrading surface, an endless traveling band vertically disposed to travel in a horizontal plane
 15 round its vertical supporting rollers on said platform to form a flexible cork holder, means to adjust the tension of said endless band, a rest for the corks to be successively deposited thereon endwise and means to feed said corks
 20 one at a time endwise onto said rest.

5. In a machine for finishing polishing or surfacing corks by grinding—the combination with an abrading surface of a platform adapted to be moved parallel to and also at
 25 right angles to the said abrading surface, a flexible cork holding device carried on said platform, means to impart traveling motion to said flexible cork holding device so as to rotate the cork while presented thereby against
 30 the said abrading surface and means to pro-

pel the said platform and parts carried thereon in a parallel direction to—as well as means to move said platform toward and away from—said abrading surface substantially in the manner and for the purposes hereinbefore set forth. 35

6. In a machine for finishing polishing or surfacing corks by grinding—the combination with a grinding disk of an endless traveling belt *i*, vertically disposed rollers *h h' h²*
 40 supporting same, a movable platform *e* carrying said rollers and belt and adapted to slide in opposite horizontal directions, means to impart reciprocating movement to said platform in said two directions, means to impart
 45 rotary motion to one or more of said vertical rollers carrying said belt and means to alter the relative positions of said rollers *h h' h²* so as thereby to adjust the tension of said flexible cork holding band *i*, all substantially in
 50 the manner and for the purposes hereinbefore set forth.

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