

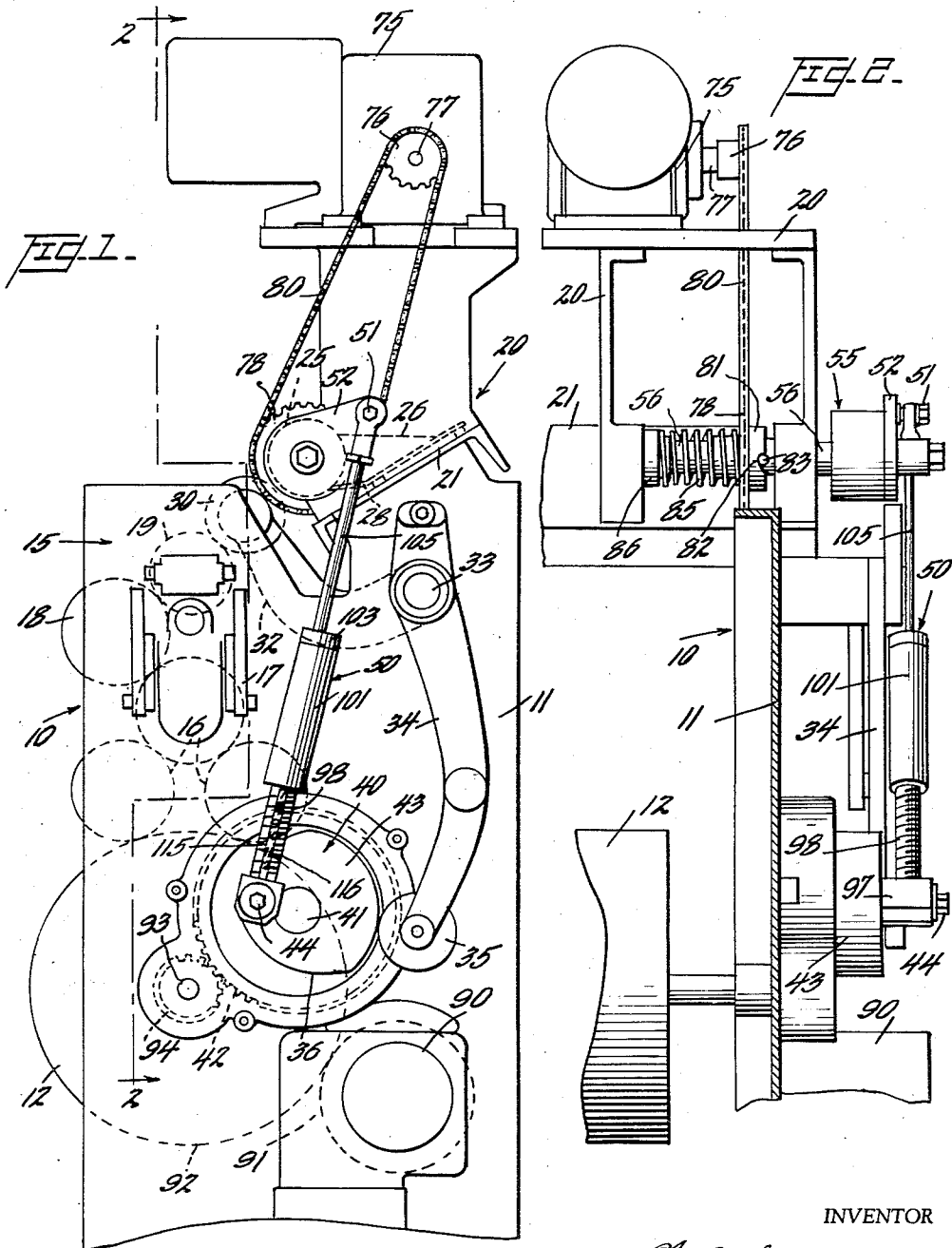
Aug. 30, 1960

W. C. STALEY
PRINTER-SLOTTERS

2,950,677

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2 Sheets-Sheet 1



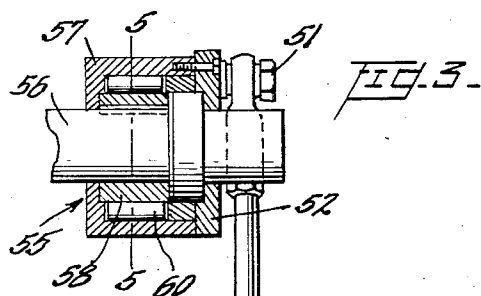
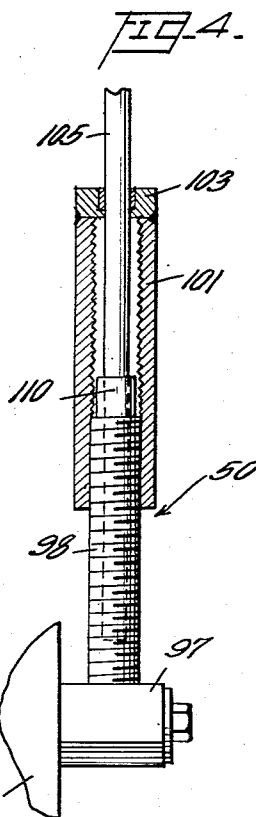
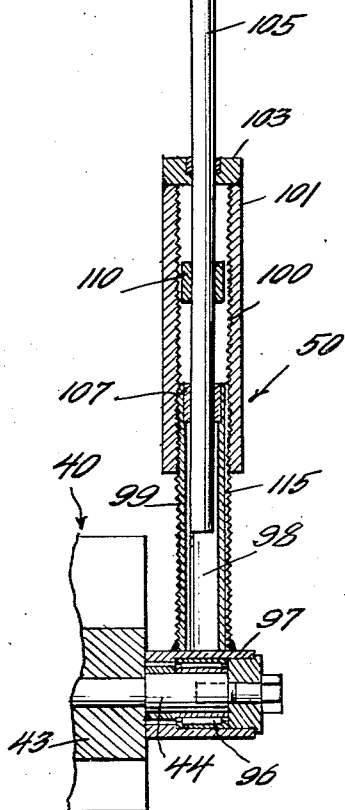
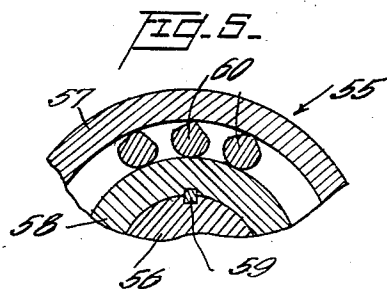
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2 Sheets-Sheet 2



INVENTOR

W. C. Staley

BY Watson, Cole, Grindle & Watson

ATTORNEYS

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PRINTER-SLOTTERS

William C. Staley, Baltimore County, Md., assignor to Greenwood Engineering Company, Inc., Baltimore, Md., a corporation of Maryland

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This invention relates to printing presses and more particularly to the inking mechanism thereof, and the principal feature of novelty has peculiar and beneficial applicability to machines used in the box and carton making industry and known as printer-slotter.

The general object of the invention is to provide a novel and improved drive for the fountain roll of such a press, featured by ingenious means for adjusting the angular degree of the increments of intermittent rotation of the fountain roll applied to it by said drive, and this while the press and fountain feed continue to operate.

The invention, in its preferred embodiment, contemplates the provision of a fountain roll positioned as usual at one edge of the adjustable ink fountain and adapted to be intermittently contacted by a ductor roll which carries the ink to the bank of ink feeding, distributor, and form rolls. Both the intermittent feed of the fountain roll and the oscillation of the ductor roll are effected from the press drive, and in the illustrated embodiment of the invention a common drive member acts both as a cam for oscillating the ductor roll and a crank arm for moving the fountain roll by means of a novel adjustable pitman or connecting rod.

The pitman or connecting rod is pivotally connected between the driving crank and another crank which serves to actuate a one-way cam clutch carried by the shaft or trunnion of the fountain roll. The use of a cam clutch in this connection gives far superior results than the conventional ratchet and dog drive, in eliminating back lash, affording smoother operation, and insuring longer life of the operative parts.

One of the principal novel features of the invention is the provision of readily accessible means for adjusting the length of the connecting rod to regulate the feed of the fountain roll. This adjustment can be made even while the press and the inking mechanism are running.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which one embodiment of the invention is illustrated by way of example.

In the drawings:

Figure 1 is a view in elevation of a side frame of a printer-slotter machine in which the principles of the invention are incorporated;

Figure 2 is a vertical sectional view taken on line 2—2 of Figure 1;

Figure 3 is a view partly in elevation and partly in section showing the adjustable crank and pitman drive connections for the fountain roll of the printer-slotter constructed and arranged according to the invention;

Figure 4 is a similar fragmentary view showing the parts of the pitman in another position of operation; and

Figure 5 is a fragmentary sectional view taken on line 5—5 of Figure 3.

Referring more particularly to Figures 1 and 2 of the drawings, it will be seen that the pertinent portion of the printer-slotter unit is indicated generally by the reference numeral 10 and comprises side frames, one of which is indicated at 11.

Rotatably supported in the side frames is a cylinder 12 which carries the printing member which may be a flex-

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ible printing plate secured around the periphery of the cylinder, or any other form of printing structure appropriate to the process being pursued. The plate or other printing member is inked by means of the inking mechanism designated generally by the reference numeral 15 and comprising form rollers 16 and other ink feeding and distributor rolls variously indicated at 17, 18, and 19.

Surmounting the main frame 11 of the printer-slotter is a superstructure 20 incorporated in which is an ink fountain 21 the left-hand confines of which is constituted by the fountain roll 25.

A normal ink level is indicated at 26 in Figure 1 of the drawings and it will be understood that the fountain roll 25 cooperates with the fountain blade 28 in the usual way to be coated with a regulated quantity of ink which is in turn picked up by the ductor roll indicated at 30 which oscillates between the fountain roll 25 and the first inking roll 19.

By suitable mechanism to be described, the fountain roll 25 is rotated intermittently in small increments of angular movement, thus presenting fresh surfaces to the ductor roll throughout the printing process.

The ductor roll is trunnioned at the ends of two swinging arms 32 pivotally mounted upon the side frame as at 33 and adapted to be oscillated by means of the crank 34 upon the lower end of which is carried a follower roller 35 which cooperates with the cam surface 36 formed on the combined crank, cam, and gear element 40.

This driving element 40 is pivotally mounted upon a stub shaft 41 carried by the side frame 11 and comprises the gear portion 42 and the cam shaped crank portion 43, the latter portion carrying a crank pin 44 to which the lower end of the novel pitman or connecting rod is pivoted, the pitman or connecting rod being indicated in its entirety by the general reference character 50.

The upper end of the connecting rod 50 is pivotally connected as at 51 with the crank member 52 which is fixed to a cam clutch device indicated at 55, this clutch device being carried upon the shaft 56 of the fountain roll 25.

The clutch 55 is of a well-known variety of cam clutch such as manufactured by Morse Chain Company of Detroit, Michigan, and illustrated and described in catalogs currently published by that company. Since these devices are well known in the art they need not be described in detail in the present specification, but it is sufficient to refer to them briefly in connection with Figures 3 and 5 of the drawings. The crank member 52 may be fashioned in the form of an end plate for the cylindrical housing 57 and an inner cylindrical hub element 58 is keyed to the shaft 56 as at 59 and the cams or cam roller elements 60 are disposed within the space between the inner and outer members 57 and 58. These cam elements are spring urged as in the conventional construction and the operation thereof will be clearly understood by those skilled in the art.

By means of this one-way clutch, it will be clearly perceived how the operation of the connecting rod 50 causes the fountain roll shaft 56 and consequently the fountain roll 25 to move successively in one direction at a timing and through an angular distance adjustable according to the purpose to be accomplished.

For the purpose of driving the fountain roll while the printer-slotter is not in operation, as for the purpose of servicing or cleaning the inking mechanism, the following mechanism is provided. A motor 75 is mounted upon the superstructure 20 and a sprocket 76 carried upon the motor shaft 77 drives a second sprocket 78 loosely sleeved upon the fountain roll shaft 56, by means of a chain 80. The sprocket member 78 incorporates a tubular portion 81 which is notched as at 82 to engage a pin 83 projecting radially from the shaft 56. A coil spring

85 seated against the sprocket and clutch elements 78, 81 and a flange 86 serves to urge the clutch into driving engagement with the pin 83. The notch 82 is so shaped that a one-way drive is afforded by means of the motor 75 and this connection will not prevent the normal incremental drive of the fountain roll by means of the crank and connecting rod element 40, 50.

The printer-slitter unit may derive its driving force from a source such as the prime mover 90, through a gear 91 which meshes with a gear 92 associated with the plate cylinder 12. Mounted on the shaft 93 of the plate cylinder along with the gear 92 is the smaller gear 94 which meshes with the toothed portion 42 of the gear, cam and crank element 40.

Now the adjustment of the pitman or connecting rod 50 for varying the feed of the fountain roll will be described, with particular reference to Figures 3 and 4 of the drawings.

The connection between the lower end of the pitman or connecting rod 50 and the crank portion 43 of the member 40 has been described as involving the crank pin 44 and an anti-friction bearing structure indicated generally at 96 in the drawings and this arrangement includes among other parts the cylindrical outer sleeve portion 97 to which is welded or otherwise secured the lower end of the externally threaded tubular or cylindrical element 98. This cylindrical lower portion of the connecting rod 50 is threaded externally as at 99 to mesh with similar internal threads 100 carried by the surrounding cylindrical or tubular member 101. The outer member 101 is capped by an end disc 103 which is provided with a central packed opening through which the rod 105 extends.

The upper end of the lower cylinder 98 is also provided with a packing or bearing sleeve 107 through which the lower portion of the rod 105 is adapted to slide.

Securely fixed to the rod 105 as by welding at a predetermined intermediate point is an abutment collar 110.

In operation the cylinder 101 in moving downwardly brings the under surface of the cap 103 into contact with the upper end of the abutment collar 110 and thus exerts a pull on the rod 105 which causes the clutch 55 to advance the fountain roller through an angle depending upon the relative adjustment of the cylinder 101 with respect to the cylinder 98. Upon return movement of the connecting rod the portion 107 carried internally by the upper end of the cylinder 98 serves as an abutment which contacts the lower end of the sleeve 110 and causes the upper retractive movement of the rod element 105. This movement, under a given seating of the extensible connecting rod 50, returns the crank 52 to the same starting position, regardless of the position of the adjusting element or nut 101.

It will be readily understood how the amplitude of the angular movement of the crank 52 and thus of the fountain roll may be adjusted by rotating the tubular nut element 101 with respect to the tubular portion 98 of the connecting rod, which varies the distance between the upper surface of the abutment collar 110 and the underside of the cap 103. For a given installation the maximum distance between the underside of the abutment collar 110 and the portion 107 is constant so that the clutch device can be returned to the same starting position.

Conveniently, the lower cylindrical member 98 may be grooved as at 115 and the calibrations 116 imprinted within the groove so as not to be disturbed by the threads 99, and the lower edge of the upper sleeve or nut member 101 serves as an indicator. It should be noted that the lower limit of the range of movement may be set at "zero" if desired.

As previously indicated, the device may be adjusted for varying the throw of the fountain roller drive while the device is in operation, merely by manually rotating the upper cylinder or nut member 101.

It will be understood that various changes and modifi-

cations may be made in the embodiment illustrated and described herein without departing from the scope of the invention as determined by the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a printing machine, a printing member; means for applying ink to said printing member, said means comprising at least one inking roll, an ink fountain device including a fountain roll adapted to be rotated intermittently through a predetermined angle, and an oscillatable ductor roll adapted to move between the fountain roll and said inking roll to transfer ink to the latter; a main drive member for said machine, transmissions actuated by said drive member for moving said printing member, for oscillating said ductor roll, and for intermittently moving said fountain roll through a predetermined angle, means for setting the transmission for the fountain roll to vary the increment of angular movement imparted thereto; auxiliary means for independently rotating said fountain roll as for cleaning or adjusting, clutches in said transmission for the fountain roll and the auxiliary rotating means for alternative operation of the fountain roll thereby, the fountain roll having an axially extended shaft; the transmission to the fountain roll from the main drive member comprising a driving crank, a connecting rod, and a one-way clutch on the shaft of said fountain roll, and a driven crank for actuating said clutch; said driven crank operatively connected to said connecting rod, and said setting means comprising means for adjusting the length of said connecting rod.

2. In a printing machine, a printing member; means for applying ink to said printing member, said means comprising at least one inking roll, an ink fountain device including a fountain roll adapted to be rotated intermittently through a predetermined angle, and an oscillatable ductor roll adapted to move between the fountain roll and said inking roll to transfer ink to the latter; a main drive member for said machine, transmissions actuated by said drive member for moving said printing member, for oscillating said ductor roll, and for intermittently moving said fountain roll through a predetermined angle, means for setting the transmission for the fountain roll to vary the increment of angular movement imparted thereto; auxiliary means for independently rotating said fountain roll as for cleaning or adjusting, clutches in said transmission for the fountain roll and the auxiliary rotating means for alternative operation of the fountain roll thereby, the fountain roll having an axially extended shaft; the transmission to the fountain roll from the main drive member comprising a driving crank, a connecting rod, and a one-way cam clutch on the shaft of said fountain roll, a driven crank for actuating said clutch; said driven crank operatively connected to said connecting rod; said auxiliary means comprising a motor, a transmission from said motor to said extended shaft, and a one-way clutch in said transmission; said respective clutches being so constructed and arranged to independently drive the fountain roll shaft in opposite directions.

3. In a printing machine, a printing member; means for applying ink to said printing member, said means comprising at least one inking roll, an ink fountain device including a fountain roll adapted to be rotated intermittently through a predetermined angle, and an oscillatable ductor roll adapted to move between the fountain roll and said inking roll to transfer ink to the latter; a main drive member for said machine, transmissions actuated by said drive member for moving said printing member, for oscillating said ductor roll, and for intermittently moving said fountain roll through a predetermined angle, means for setting the transmission for the fountain roll to vary the increment of angular movement imparted thereto; auxiliary means for independently rotating said fountain roll as for cleaning or adjusting, clutches in said transmission for the fountain roll and the auxiliary rotating means for alternative operation of the fountain roll

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thereby, the fountain roll having an axially extended shaft; the transmission to the fountain roll from the main drive member comprising a driving crank, a connecting rod, and a one-way cam clutch on the shaft of said fountain roll, a driven crank for actuating said clutch, said driven crank operatively connected to said connecting rod, and said setting means comprising means for adjusting the length of said connecting rod; said auxiliary means comprising a motor, a transmission from said motor to said extended shaft, and a one-way clutch in said transmission; said respective clutches being so constructed and arranged to independently drive the fountain roll shaft in opposite directions; the transmission means of the auxiliary member comprising a chain and sprocket drive, including a driven sprocket loosely mounted on the fountain roll shaft and having a notched hub, a pin on said shaft for engagement by the notch for driving the shaft in one direction, and a spring urging said sprocket toward pin engaging position.

4. In a printing machine, a printing member; means for applying ink to said printing member, said means comprising at least one inking roll, an ink fountain device including a fountain roll having an axle shaft and adapted to be rotated intermittently through a predetermined angle, and an oscillatable ductor roll adapted to move between the fountain roll and said inking roll to transfer ink to the latter, a main drive member for said machine, a combined gear, crank, and cam member rotatably carried by said machine, operative connections between said driving member and the gear of said combined member, an extensibly adjustable connecting rod having one end pivoted off-center to said combined member, a one-way clutch device carried by the shaft of said fountain roll, and means connecting the opposite end of said connecting rod to said clutch device, a periphery of said combined member comprising a cam surface, swinging lever arms pivoted to said machine and serving to rotatably support the ends of said ductor roll, a cam follower arm rigid with said levers and carrying a follower roller which contacts said peripheral cam surface, and spring means for maintaining said roller in contact with said cam surface.

5. In a printing machine, a printing member; means for applying ink to said printing member, said means comprising at least one inking roll, an ink fountain device including a fountain roll having an axle shaft and adapted to be rotated intermittently through a predetermined angle, and an oscillatable ductor roll adapted to move between the fountain roll and said inking roll to transfer ink to the latter; a main drive member for said machine, a driving crank rotatably carried by said machine and operatively connected with said drive member, an oscillatable driven crank member carried by the shaft of said fountain roll, and a one-way clutch on said fountain roll shaft and operated by said driven crank; a connecting rod connecting said driving crank with said driven crank to convert the rotative motion of said driving crank to intermittent oscillatory motion of said driven crank, said connecting rod comprising a tubular portion pivotally connected to one of the cranks, a second tubular portion threaded to said first tubular portion for adjustable telescoping engagement, an internal stop element near the remote end of said second cylindrical portion, a rod portion pivotally connected at one of its ends with the other crank and extending through at least the outer or second cylindrical portion beyond the stop element carried thereby, a stop element carried internally by said first named cylindrical portion, and an abutment element carried by said rod portion and disposed between the stop elements of said cylindrical portions, whereby the distance the driven crank is moved may be adjusted by screw adjustment of the two cylindrical portions to regulate the spacing of the stop elements and the point of engagement thereby of the abutment elements.

6. In a printing machine, a printing member; means

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for applying ink to said printing member, said means comprising at least one inking roll, an ink fountain device including a fountain roll having an axle shaft and adapted to be rotated intermittently through a predetermined angle, and an oscillatable ductor roll adapted to move between the fountain roll and said inking roll to transfer ink to the latter, a main drive member for said machine, the printing member being a rotary plate cylinder having an axially extending shaft, a driving crank fixed to said shaft, an oscillatable driven crank member carried by the shaft of said fountain roll and a one-way cam clutch on said fountain roll shaft and operated by said driven crank, a connecting rod connecting said driving crank with said driven crank to convert the rotative movement of said driving crank to intermittent oscillatory motion of said driven crank, said connecting rod comprising a tubular portion pivotally connected to the driving crank, a second tubular portion threaded to said first tubular portion for adjustable telescoping engagement, an internal stop element near the remote end of said second cylindrical portion, a rod portion pivotally connected at one of its ends with the driven crank and extending through at least the outer or second cylindrical portion beyond the stop element carried thereby, a stop element carried internally by said first named cylindrical portion, and an abutment element carried by said rod portion and disposed between the stop elements of said cylindrical portions whereby the distance the driven crank is moved may be adjusted by screw adjustment of the two cylindrical portions to regulate the spacing of the stop elements and the point of engagement thereby of the abutment elements.

7. In a printing machine, a fountain roll adapted intermittently to be rotated through a predetermined angle, an axially extended shaft for said fountain roll, a one-way clutch on said shaft, an oscillatably swinging crank arm extending radially from said clutch; a completely rotatable driving crank; an extensible connecting rod device having its ends respectively pivotally connected with the ends of said cranks; said connecting rod device comprising a first tubular portion connected with said driving crank, a second tubular portion telescoping with and threadedly connected with said first named tubular portion, an internal stop element carried by each of the two respective tubular portions adjacent their ends remote from the driving crank connection, an attenuated rod member having one end pivotally connected with said driven crank and the other end portion of the rod member extending through at least said second named tubular portion, and an abutment element on said rod member disposed between the stop elements of the respective tubular portions; whereby movement of the two inter-threaded tubular portions in a direction away from the driven crank will cause the stop element of the second tubular portion to contact the rod-carried abutment element and draw the rod member along to the limit of movement of the tubular portions, and return movement of the tubular portions will cause the stop element of the first named tubular portion to contact the abutment element and return the rod member and the driven crank to their original positions, and whereby relative telescoping adjustment of the two tubular portions will regulate the length of movement of the rod member during each cycle and thus the intermittent movement of the driven crank.

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