

No. 816,179.

PATENTED MAR. 27, 1906.

I. E. PALMER.  
APPARATUS FOR WASHING FABRICS.

APPLICATION FILED SEPT. 22, 1904.

2 SHEETS—SHEET 1.

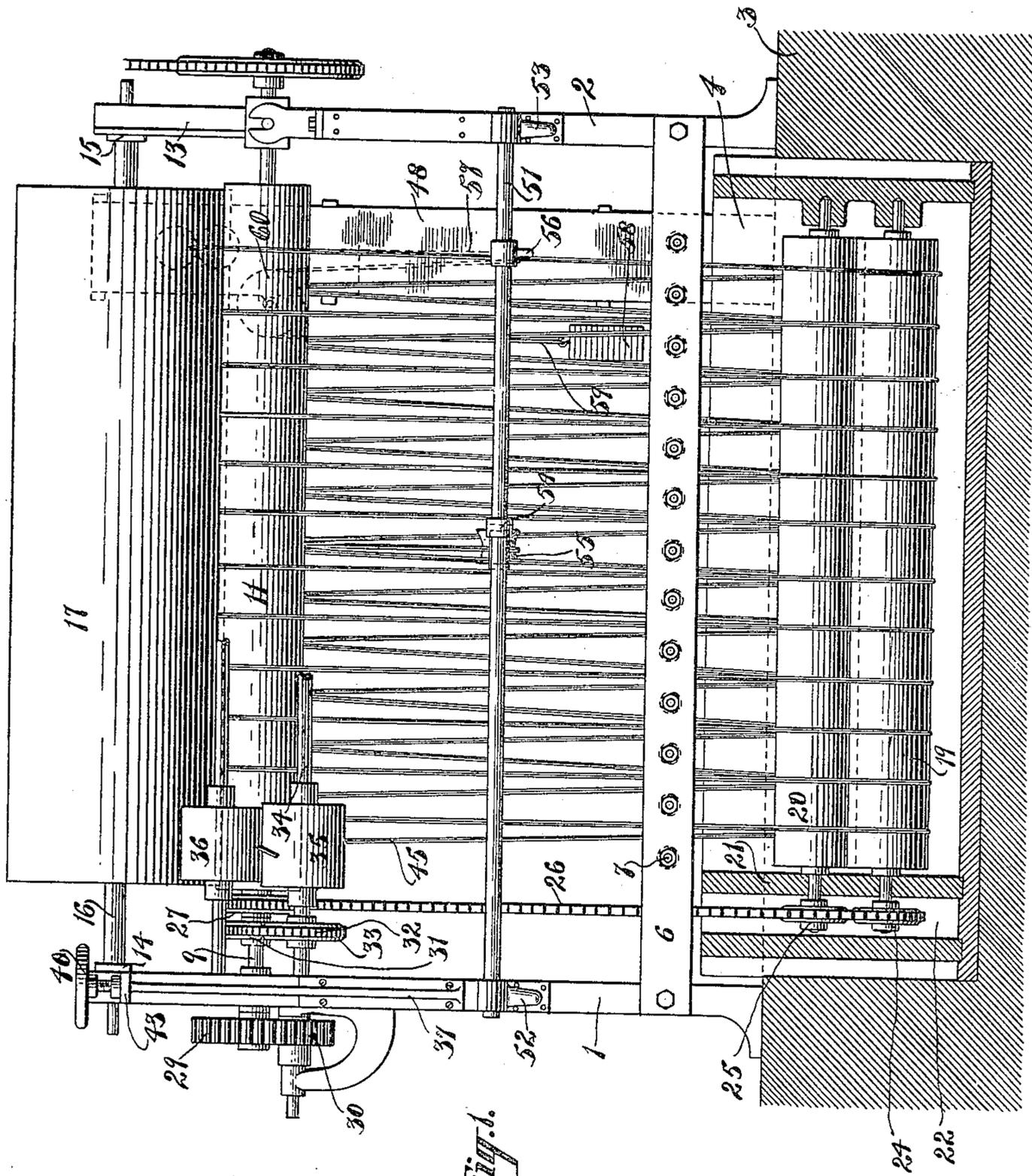


Fig. 1.

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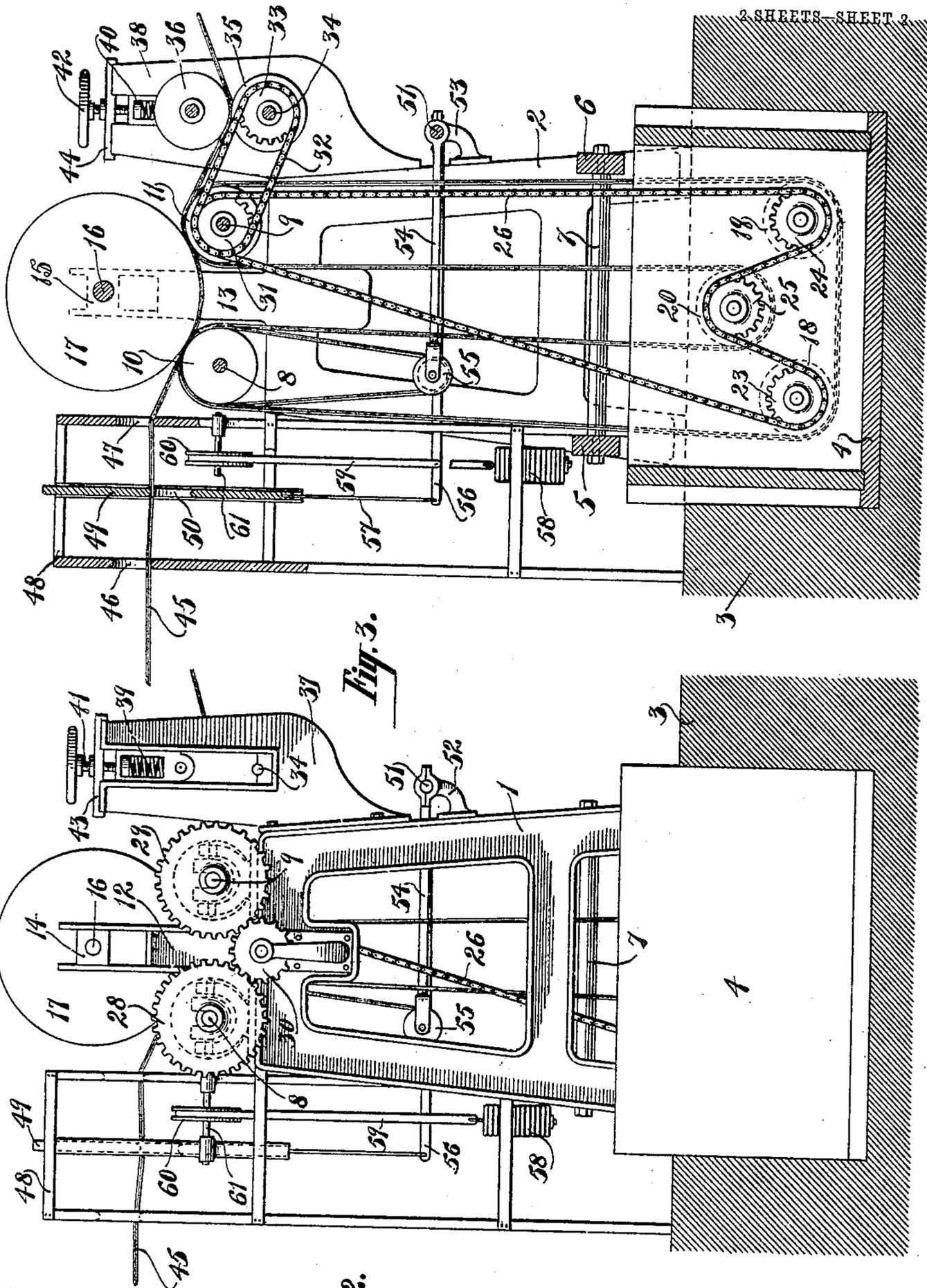


Fig. 3.

Fig. 2.

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# UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

## APPARATUS FOR WASHING FABRICS.

No. 816,179.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed September 22, 1904. Serial No. 225,512.

*To all whom it may concern:*

Be it known that I, ISAAC E. PALMER, a citizen of the United States, and a resident of Middletown, in the county of Middlesex and State of Connecticut, have invented a new and useful Apparatus for Washing Fabrics, of which the following is a specification.

My invention relates to apparatus for washing fabric with a view of providing efficient means for rapidly removing foreign material from the fabric without distorting it under excessive strain.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the apparatus in side elevation. Fig. 2 is an end view, and Fig. 3 is a vertical transverse section.

The frame of the apparatus may be of any suitable shape and size, the form here shown consisting of a pair of skeleton end frames 1 and 2, uprising from the foundation 3 at the opposite ends of the vat 4, in which the washing liquid is held. The end frames 1 are connected by rails 5 and 6, along which spacing-bars 7 are located at frequent intervals to separate the parts of the fabric as it passes up and down under the different rollers into groups.

On the tops of the end pieces 1 and 2 suitable brackets are secured for supporting the shafts 8 and 9 of the carrying or guide rollers 10 and 11, and the said ends 1 and 2 are further provided with upward extensions 12 and 13 for the reception of vertically-sliding bearings 14 and 15, in which the shaft 16 of the squeezing or pressure roller 17 is mounted.

In the vat 4 three rollers are mounted, two, 18 and 19, being preferably located in the same horizontal plane, while the third, 20, is located a little above and between the two rollers 18 and 19. The vat is provided with a partition 21 near one end, cutting off a narrow chamber 22, into which the shafts of the rollers 18, 19, and 20 project and in which they are provided with sprocket-wheels 23, 24, and 25, respectively, for the reception of a driving sprocket-chain 26, engaged with a sprocket-wheel 27 on the shaft 9 of the roller 11.

The shafts 8 and 9 of the rollers 10 and 11 are provided exterior to their bearings at one end with gear-wheels 28 29, in mesh with a common drive-gear 30, driven by a suitable source of power. (Not shown.) The shaft

of the roller 11 is further provided with a sprocket-wheel 31, connected by a sprocket-chain 32 with a sprocket-wheel 33 on the shaft 34 of a delivery-roll 35, which coacts with a companion delivery-roll 36 to draw the fabric through the washing apparatus. The shaft of the roll 35 is mounted in suitable bearings in brackets attached to the sides of the end pieces 1 and 2, respectively, these brackets being denoted, respectively, by 37 and 38, one of them being shown in Fig. 2 and the other in Fig. 3. The roll 36 is mounted in sliding bearings in the said brackets and is held normally pressed toward the roller 35 by means of springs 39 and 40, which are placed under greater or lesser tension by means of hand-screws 41 and 42, engaged in caps 43 and 44 on the brackets 37 and 38, respectively.

The rope of fabric (denoted by 45) is introduced to the washing apparatus between the guide or carrying roll 10 and the squeezing or pressing roll 17 through openings 46 and 47 in the walls of a skeleton upright frame 48, and provision is made for placing more or less tension on the rope of fabric 45 by introducing between the openings 46 and 47 in the frame 48 a vertically-movable slide 49, provided with an opening 50, through which the rope of fabric 45 passes, so that when the slide 49 is lowered to a point where the upper wall of the opening 50 is below the lower walls of the openings 46 and 47 the fabric will be deflected from a direct line between the openings 46 and 47, and hence additional tension placed upon it, while if the plunger of the slide 49 be lifted until the opening 50 registers with the openings 46 and 47 the rope of fabric may be allowed to pass freely and in a direct line through the several openings, and thus the tension upon it or retarding effect be lessened.

The slide 49 is automatically adjusted by the rope of fabric itself as follows: A rock-shaft 51 is mounted in suitable brackets 52 and 53 on the sides of the ends 1 and 2 and is provided intermediate of its ends, preferably about midway of the length of the rollers 10 and 11, with an arm 54, carrying a pulley 55, preferably a groove-faced pulley, around which the rope of fabric from the roller 10 is made to pass and then back again over the roller 10 before being extended into engagement with the rollers in the vat, as will be hereinafter explained. The lifting upwardly on the

arm 54 by any unusual strain on the rope of fabric is transmitted to the slide 49 by means of an arm 56, made fast on the rock-shaft 51 at one end and at its opposite end provided with a  
5 connecting-rod 57, extending from it to the lower end of the slide 49.

In order to make the apparatus sensitive and regulate the tension to any desired degree, I counterbalance the weight of the slide  
10 49, connecting-rod 57, arms 56 and 54, and pulley 55 by means of a weight 58, connected with the arm 56 by means of a flexible connection 59, which passes from the weights up and over a guide-pulley 60, mounted on a  
15 spindle 61, attached to the frame 48, and thence downwardly to the arm 56. The counterbalance-weight 58 is preferably made up of sections, one or more of which may be removed, or the number of sections increased  
20 to produce a greater or lesser lifting effect upon the arm 56 to enable the rope of fabric 45 to pass normally more or less directly through the openings in the frame 48. The rope of fabric 45 after passing through the  
25 openings 46, 50, and 47 passes between the rollers 10 and 17, thence downwardly into the vat under the roller 20, thence upwardly over the roller 11, thence downwardly under the rollers 19 and 18 in the same transverse  
30 plane as that in which it passed down under the roller 20 and upward therefrom, thence upwardly over the roller 10, and so on, repeating its turns throughout the length of the rollers 10, 11, and 17, each succeeding  
35 downward passage of the rope 45 from the roller 10 passing through a succeeding space between the spacing-bars 7, thus making a group of four parts in each succeeding space. After reaching about midway the length of  
40 the rollers the rope of fabric instead of passing from the roller 10 down to the roller 20 is passed down and around the pulley 55, thence upwardly over the roller 10 and thence downwardly under the roller 20, and so on, as  
45 in the beginning, and, finally, the rope of rinsed or washed fabric is led from the roller 11 outwardly between the squeezing and delivering rollers 35 and 36.

Aside from the advantages of maintaining  
50 an even tension upon the rope of fabric by the automatic lifting of the slide 49—a very important advantage, particularly in connection with the washing and rinsing of loosely-woven or network fabrics—my present apparatus  
55 provides for a double squeezing and a double soaking of the fabric before it a second time comes into engagement with the initial carrying or guide roller—in the present instance the roller 10. For instance, assume the rope of  
60 fabric to have been introduced and to have been passed into the tank under the roller 20 and thence upwardly over the roller 11 and down under the rollers 19 and 18. It will now pass upwardly thoroughly soaked toward the  
65 roller 10, and in passing between the rollers 10

and 17 will be thoroughly squeezed and will pass down again in a comparatively non-saturated condition between the roller 20, thence upwardly between the rollers 17 and 11, where  
70 it will again be thoroughly squeezed, and from there it will pass down in a comparatively non-saturated condition into the tank or vat and in passing under the rollers 19 and 18 will be again thoroughly soaked, again to be squeezed  
75 between the rollers 17 and 10, and so on throughout the length of the apparatus. This has a tendency to very rapidly and very effectually free the fabric from any foreign matter, and it finally comes from the machine thoroughly  
80 cleansed.

While I have described the foregoing apparatus as apparatus for washing fabrics, it may also be used with great advantage in dyeing fabrics by simply substituting for the cleansing liquid in the vat a liquid dye, and hence I  
85 do not wish to limit it strictly to the washing of a fabric, but wish to be understood as including dyeing the fabric as well.

What I claim is—

1. In apparatus for washing fabric, the  
90 combination with a tank or vat for holding the cleansing liquid, rollers for directing fabric into and out of the tank and means for feeding the fabric along said rollers, of a tension device and means under the control of  
95 the fabric for operating the tension device.

2. In apparatus for washing fabric, the combination with a tank or vat for holding the cleansing liquid, rollers for directing fabric into and out of the tank and means for  
100 feeding the fabric along the rollers, of a guide for directing the fabric to the receiving-rollers, a vertically-movable slide for throwing the fabric out of a direct line as it passes through the guide and means under the control of the fabric for raising and lowering the  
105 said slide.

3. In apparatus for washing fabric, the combination with a tank or vat for holding the cleansing liquid, rollers for directing fabric into and out of the tank, and means for  
110 feeding the fabric along the rollers, of a guide comprising spaced perforated walls through which the fabric passes to the receiving-rollers, a reciprocating slide located intermediate  
115 of said walls and provided with a perforation through which the fabric passes, a rocking-arm for operating the slide and means engaged by the fabric for rocking the arm and hence operating the slide to increase or di-  
120 minish the tension of the fabric.

4. In apparatus for washing fabric, the combination with a tank or vat for holding the cleansing liquid, rollers for directing fabric into and out of the cleansing liquid and  
125 means for feeding the fabric along the rollers, of a rock-shaft, arms fixed to and extending laterally from the rock-shaft, a tension device connected with one of the arms, the other arm being engaged with the fabric whereby  
130

the tension device is under the control of the fabric to increase or diminish the tension on the said fabric.

5 In apparatus for washing fabric, the combination with a tank or vat for receiving the cleansing liquid, rollers for directing the fabric into and out of the cleansing liquid and means for feeding the fabric along the rollers, of a guide for directing the fabric to the receiving-rollers, a vertically-reciprocating slide engaged with the fabric as it passes through the guide, means for placing the tension device un-

der the control of the fabric and means for counterbalancing the weight of the tension device.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 14th day of September, A. D. 1904.

ISAAC E. PALMER.

Witnesses:

CHAS. M. SAUER,  
PAUL S. CARRIER.

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