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(54) **Tailing tool for yarn winding and method of using same.**

(57) A tail on a yarn package formed on a rotatable support core (1) is formed using a "tailing" tool (7) having a rotatable yarn guide (10) with a U-shaped yarn locating portion (10*a*) arranged so that the bight of the portion (10*a*) rotates to traverse the yarn towards an adjacent end of the yarn support core (1) on top of an initial convolution (15*a*) of the tail whereby the main tail (15) traps the initial convolution in place.

Rotation of the yarn guide (10) is manually effected by means of a control lever (11).

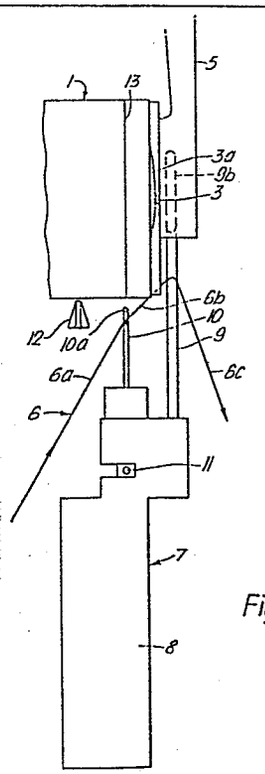

Fig.2.

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DESCRIPTION

"TAILING TOOL FOR YARN WINDING AND METHOD OF USING SAME"

The present invention relates to winding yarn, and in particular to the reliable formation of a tail at the start of winding up a fresh package.

It is known to provide a tail of yarn when starting to wind up yarn on a new support, upon completion of a preceding package. However, the tail has in the past been susceptible to unravelling from the support core and consequently during storage and subsequent handling of the full package the tail may become caught up and the main yarn package begin to unravel. GB Application 1471472 (Socitex) discloses an automatic yarn reserve builder which is actuated in response to a change of bobbins, and in Figures 5 and 6 there is disclosure of a system which will automatically build the reserve during a preliminary partial traverse in a direction opposed to the direction of traverse common to the transfer tail attachment traverse and the first main traverse of the yarn guide during winding of the main package. This forms a so-called "trapped" or "protected" tail in which the tail end is under the reserve.

It is an object of the present invention to provide a simple hand-held tool to facilitate the formation of a "trapped" tail without the need for an automatic reserve builder at each winding station of a multi-position yarn winder.

In accordance with one aspect of the present invention we provide a hand-held tool for forming a tail on a rotating yarn support core, comprising: means for holding a run of a yarn, which is in contact with said tool, against the support core for effecting traverse in a first direction; characterised by means for positioning the tool in relation to a rotatable yarn support core; movable means

for guiding that run of yarn for traverse in a second direction during formation of a yarn tail on the core; and a manually operable control to effect said traverse in the second direction and to effect release of the yarn, after said traverse in the second direction, for starting a main traverse to begin build-up of a yarn package on the support core.

The present invention also provides a method of forming a tail on a rotating yarn support core during yarn winding comprising: holding a run of the yarn against the support core for effecting traverse in a first direction; winding the yarn onto the end of the core, starting from the end of the tail, in a first direction of traverse; forming a reserve by winding the yarn in a second direction of traverse, and releasing the yarn to start winding of a yarn package in the first direction of traverse, characterised by positioning a hand-held tool in relation to the rotatable yarn support core, the tool including means for holding the run of the yarn in contact with said tool when so positioned; manually operating movable means for guiding that run of yarn for traverse in the second direction during formation of the yarn reserve on the core by use of a manually operable control of the tool; and effecting release of the yarn, after said traverse in the second direction, by further operation of the movable means at the end of the reserve-forming traverse in the second direction.

In order that the present invention may more readily be understood the following description is given, merely by way of example, with reference to the accompanying drawings in which:-

FIGURE 1 is an end elevational view of a yarn support core at the start-up of yarn winding, and showing the use of a "tailing" tool in accordance with the present invention;

FIGURE 2 is a view of the same end of the yarn support core, and of the "tailing" tool when viewed from the lefthand side of Figure 1; and

FIGURE 3 is a view corresponding to Figure 2, but showing the winding operation during a subsequent stage of the build-up of the tail.

As shown in Figure 1, the yarn support core 1 has at its end yarn pick-up slots 3 intended to pick up the yarn to define the end of the tail.

The yarn support core 1 is caused to rotate, in the anticlockwise direction as viewed in Figure 1, by frictional contact with the take-up roll 4 alongside it. In order to interrupt drive to the yarn support core 1, it is mounted on a swinging package arm 5 allowing it to be moved towards and away from the take-up roll 4. This same swinging action of the package arm 5 also allows the yarn support core 1 to move further away from the axis of rotation of the take-up roll 4 as the yarn package (not shown) builds up on the cylindrical surface of the core 1.

Yarn 6 is initially threaded up with the aid of a "tailing" tool 7 having a handle 8, a main hook 9, and a secondary hook 10, the latter being rotatable and controlled by a lever 11 fixed to it.

Figure 2 also shows a yarn traverse guide 12 which oscillates to-and-fro in a direction parallel to the axis of the yarn support core 1 so as to cause the yarn package to build up on the core 1 in a controlled manner with the appropriate overall profile for the package (usually requiring the first layers of the package to extend closer to the ends of the yarn support core 1 than the later layers so that the package has a stable, tapered profile).

In Figure 2, the yarn pick-up slot 3 is the one visible on the lefthand side of Figure 1 and it will be clear that during rotation of the yarn support core 1 that slot 3 will eventually (after a quarter of a revolution)

come into register with the run of yarn 6 guided between the main and secondary hooks of the "tailing" tool 7.

For ease of explanation, the yarn 6 can be considered as three separate runs 6a, 6b and 6c, along which any point on the continuous yarn will travel. The run 6a is from the delivery to the secondary hook 10, the run 6b is from the secondary hook 10 to a guide bar 9a of the main hook 9, and the run 6c extends from the main hook 9 to a waste suction tube (not shown).

Upon rotation of the yarn support core 1, the yarn run 6a will initially ride on the end surface of the yarn support core 1 but as soon as one of the two pick-up slots 3 comes into register with it it will be entrained by that slot 3 and rapidly severed somewhere between that point of catching in the slot 3 and the waste suction tube (probably along the run 6c).

As shown in Figure 2, the yarn support core 1 includes chamfers 3a around the pick-up slot 3, so as to guide the loose severed end of the yarn into the slot 3 where the end will be held to prevent flaying during winding.

Reference to Figure 1 will show that in the position depicted by Figures 1 and 2 the U-shaped yarn locating portion 10a at the end of the secondary hook 10 is holding the yarn (at the junction between the runs 6a and 6b) at a point which is further away from the viewer in Figure 2 than is the axis of rotation of the secondary hook 10. Thus as the secondary hook 10 is rotated in the clockwise direction as viewed from above the point of holding the yarn (near the bight of the U) moves rightwardly from registration with the line 13 in Figure 2 representing what we shall refer to as the "initial tail line". This gives rise to a subsequent tail line 14 (Figure 3) which is displaced rightwardly to arrive at the righthand end of the tail build-up on the yarn support core 1. The movement of the secondary hook 10 and its

actuating lever 11 to arrive at this situation can be appreciated by comparing Figures 2 and 3.

Whereas in the Figure 2 position the horizontally extending upper limit of the U-shaped yarn locating end portion 10a of the secondary hook 10 provides a barrier to prevent the yarn from moving axially along the yarn support core 1 away from its end, this constraint is removed by the time the Figure 3 position has been adopted. The axis of rotation of the secondary hook 10 lies in the plane of the U of the yarn locating portion 10a and intersects the limits of the U at locations spaced from their ends adjacent the bight of the U so, as the secondary hook 10 rotates, the bight and preferably at least an adjacent part of each limit will orbit the hook axis of rotation to traverse the tail yarn rightwardly and to allow the yarn run 6a to release itself automatically from the secondary hook 10 and to move across to be entrained by the traversing guide 12 (Figure 2).

The advantage of forming a tail using the "tailing" tool 7 illustrated is that the tail 15 is initially formed by a tail run 15a which extends from the pick-up slot 3 as far as the initial line (13 in Figure 2) and subsequently the build-up of the tail 15 traverses back over the top of this run 15a and helps to lock the run 15a in place. Consequently, use of the "tailing" tool in accordance with the present invention allows the tail to have its first convolution or convolutions trapped by the subsequently formed convolutions wound thereon, leaving the finished tail stable. The resulting package is therefore more easily handled and requires less care to be taken during storage.

The main hook 9 of the tool has an end 9b which co-operates with the bracket 5 to locate the tool in the

correct position (a) axially of the yarn support core 1 so as to maintain the geometry illustrated in Figure 1, and (b) radially of the yarn support core axis so as to maintain the geometry of the Figure 2 position.

The important characteristic of the "tailing" tool 7 is that it should incorporate means for shifting the tailing line axially of the yarn support core 1, during tail formation in a direction to trap the initial yarn tail convolution or convolutions.

CLAIMS

1. A hand-held tool for forming a tail on a rotating yarn support core (1), comprising: means (9a) for holding a run (6a) of a yarn, which is in contact with said tool, against the support core for effecting traverse in a first direction; characterised by means (9a) for positioning the tool in relation to a rotatable yarn supporting core; movable means (10) for guiding that run of yarn for traverse in a second direction during formation of a yarn tail (15) on the core; and a manually operable control (11) to effect said traverse in the second direction and to effect release of the yarn, after said traverse in the second direction, for starting a main traverse to begin build-up of a yarn package on the support core.

2. A tool according to claim 1, characterised in that said means for guiding the run of yarn for effecting the traverse in a second direction comprises a rotatable yarn guide (10) having a yarn locating portion (10b) mounted to orbit around the axis of rotation of the yarn guide to effect the traverse in the second direction, and arranged so as to release the yarn at or near completion of said traverse.

3. A tool according to claim 2, characterised in that said yarn locating portion is the bight (10b) of a U-shaped end portion (10a) of the yarn guide, the axis of symmetry of the U being perpendicular to the axis of rotation of the yarn guide; and in that the axis of rotation of the yarn guide intersects the plane of the U at a location spaced from the two ends of the side limbs of the U which join the bight (10b) of the U, whereby the yarn is located at or near the bight of the U and the run of yarn from the locating portion to the rotating yarn core is caused to traverse in said second direction during rotation of the yarn guide through a quarter of a revolution during operation of said manual control (11).

4. A tool according to any one of claims 1 to 3, characterised in that said positioning means comprise part (9b) of a hook (9) arranged to co-operate with supporting means (5) for the rotatable yarn support core (1), to enable the tool to be held adjacent one end of the yarn support core for stringing up the yarn on the support core.

5. A tool according to any one of claims 1 to 4, characterised in that said means for holding the run (6b) of yarn against the support core (1) comprise a stationary guide bar (9a) of said tool, mounted alongside said movable means (10) for guiding the run of yarn for the traverse in the second direction.

6. A tool according to claims 4 and 5 taken together, characterised in that the guide bar (9a) is also a part of the hook (9) of the tool.

7. The combination of a tool according to any one of claims 1 to 6, together with a yarn support core, characterised by the core (1) having a yarn pick-up slot (3) at one end to locate the free end of the tail at the end of the core (1).

8. A method of forming a tail on a rotating yarn support core (1) during yarn winding comprising: holding a run (6b) of the yarn against the support core for effecting traverse in a first direction; winding the yarn onto the end of the core, starting from the end of the tail, in a first direction of traverse; forming a reserve by winding the yarn in a second direction of traverse, and releasing the yarn to start winding of a yarn package in the first direction of traverse, characterised by positioning a hand-held tool in relation to the rotatable yarn support core (1), the tool including means (9a) for holding the run (6b) of the yarn in contact with said tool when so positioned; manually operating movable means (10) for guiding that run (6b) of yarn for traverse in the second direction during formation of the yarn reserve (15) on the core by use of a manually operable control (11) of the tool; and effecting release of of the yarn, after said traverse in the second direction, by further operation of the movable means at the end of the reserve-forming traverse in the second direction.

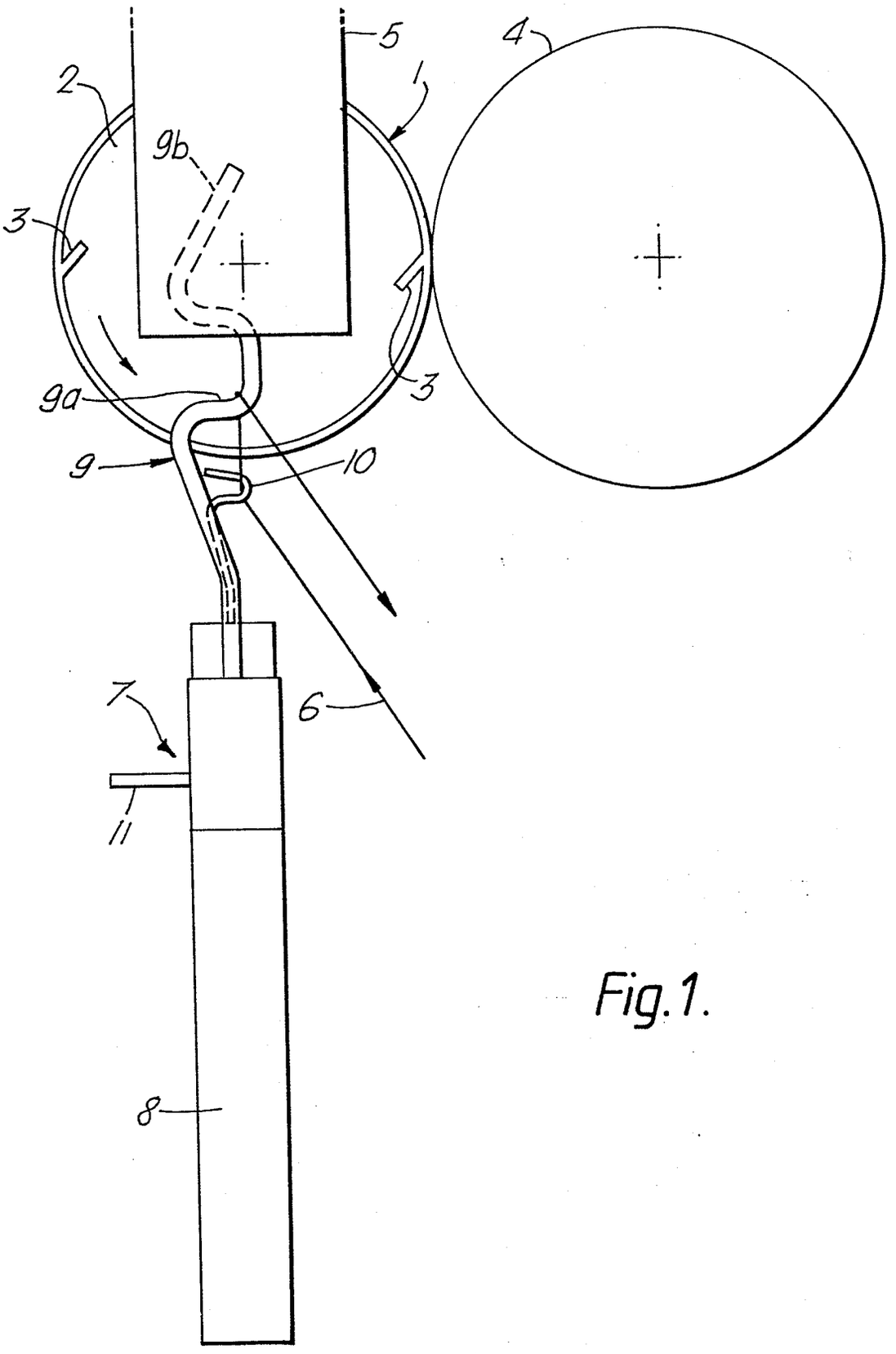

Fig.1.

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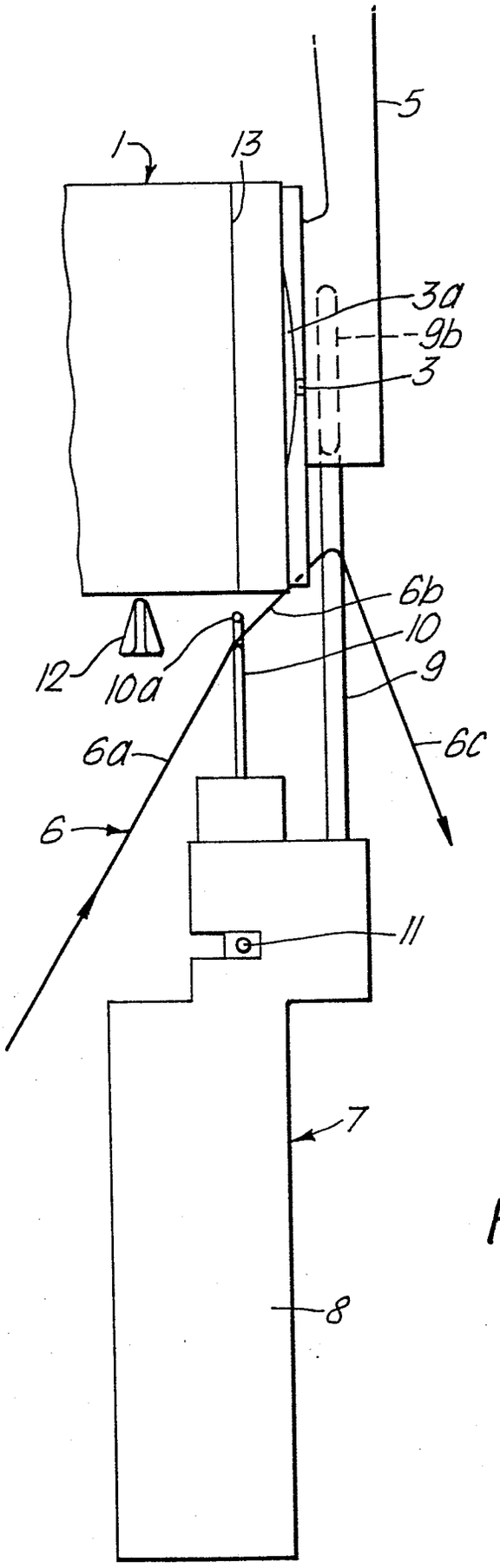

Fig.2.

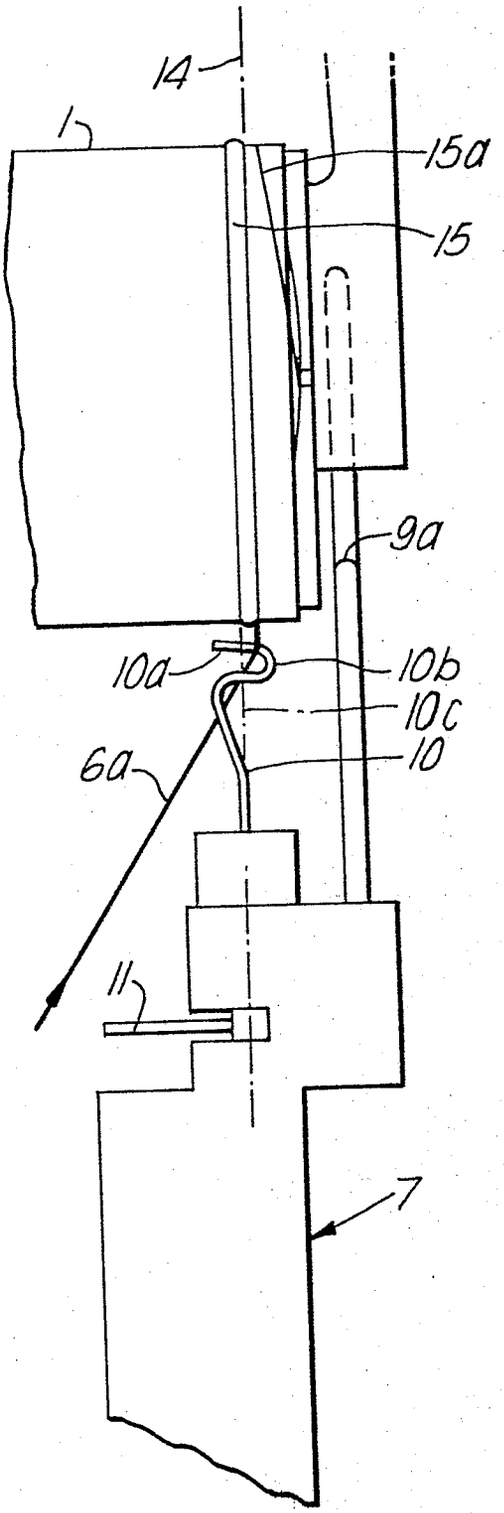

Fig. 3.

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EUROPEAN SEARCH REPORT

0124962
Application number

EP 84 30 1342

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
A	DE-A-2 705 392 (LUWA) * Whole document *	1,8	B 65 H 54/34
X		7	
X	WO-A-7 900 803 (RIETER) * Whole document *	7	
X	DE-A-2 551 754 (EASTMAN KODAK) * Whole document *	7	
A	DE-B-2 826 392 (ZINSER) * Whole document *		TECHNICAL FIELDS SEARCHED (Int. Cl. ³) B 65 H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	23-07-1984	DEPRUN M.

CATEGORY OF CITED DOCUMENTS

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