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(54) **Abrasive belt sleeve for sanding machines**

(57) Sleeve (55) of abrasive material for sanding-smoothing machines including at least one operative roller includes an external layer of abrasive material and an inner layer of a soft material (M) fixed to the external

layer by suitable adhesive means. The inner layer adheres to the tensing roller (5) and to the operative roller (50) of a sanding-smoothing machine (3). The inner layer (11) interacts with the external layer, so as to flatten in a working area set in contact with the floor below.

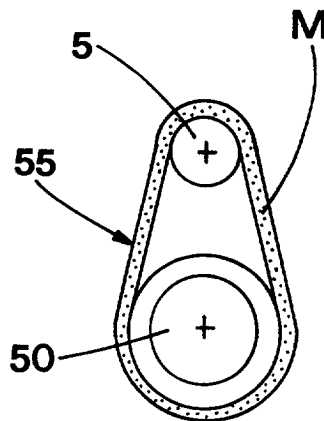


FIG. 5

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Description

[0001] The present invention relates to abrasive belts for sanding-smoothing machines, including a horizontal operative roller, onto which an abrasive paper belt forming a sleeve is mounted; the belt is aimed at eliminating defects, such as long undulations, present in wooden floors.

[0002] Some sanding-smoothing machines include one operative roller while other machines include two operative rollers.

[0003] The first type of machines includes one tensing roller and one operative roller, e.g. horizontal; a belt of abrasive paper is mounted around both rollers.

[0004] The second type of machines include two operative rollers, which have horizontal axes too; an abrasive paper is mounted on each of these horizontal operative rollers.

[0005] Both types of sanding-smoothing machines work in an analogous way.

[0006] As already said, the belt of abrasive paper forms a sleeve, whose section allows it to be put on the related roller/s, so as to tightly surround it/them.

[0007] The above mentioned machines are used for roughing-out and/or smoothing wooden floors.

[0008] First of all, it is necessary to choose an abrasive paper sleeve whose grain is suitable for the kind of the required operation.

[0009] After the proper sleeve has been chosen, it is put on the related operative roller, which is later placed to touch the floor.

[0010] Then, the handle of the machine is slightly pressed in the direction of its movement; the pressure must be stronger in case roughing-out is to be performed, and slighter in case of finishing or smoothing.

[0011] This procedure features some disadvantages deriving from the too rigid structure of the sleeves of abrasive paper.

[0012] It is possible that the sleeve does not adhere to the operative roller tightly enough and consequently, during operation, the operative roller speed and the machine movement speed make the sleeve slide on the operative roller, since the operative roller and the sleeve touch each other with smooth surfaces.

[0013] Thus, it can happen that the sleeve of abrasive belt crumples up in the area of the rear part of the operative roller.

[0014] In extreme cases, it is possible that, during operation, after having crumpled up, the sleeve is removed from the operative roller.

[0015] In such cases, it can happen that the abrasive belt sleeve loses its correct working position, thus interrupting the working and in extreme cases, damaging the floor surface.

[0016] Moreover, the traditional sleeve presents also other disadvantages; during operation, the sleeve can rough out and/or smooth a portion of the floor equal to the length of the operative roller, on which it is mounted.

[0017] During the machine operation, clear longitudinal lines remain on the floor, made by the sleeve ends.

[0018] The lines can be removed only by another run of the machine, which results in waste of time, bigger use of abrasive belt and further reduction of the floor thickness.

[0019] Another disadvantage of the smoothing machine with operative rollers, on which sleeves of abrasive paper of known type are set, derives from the fact that due to the rigidity of the sleeves, only a tangential contact with the surface P of the floor is possible, which limits the sleeve working area.

[0020] Moreover, the rigidity prevents a perfect smoothing of the surface, i.e. does not effectively eliminate or level the considerable undulations deriving from an imperfect floor assembly, since the contact between the operative roller and the floor is not always ensured.

[0021] The main object of the present invention is to reduce the rigidity of the sleeve/operative roller assembly, so as to make the latter auto-modeling in order to avoid the above described disadvantages.

[0022] Another object of the present invention is to increase the working area of sleeves of abrasive belt, mounted on each operative roller.

[0023] The above mentioned objects are obtained in accordance with the claims.

[0024] The characteristic features of the present invention will be pointed out in the following description with reference to the enclosed drawings, in which:

- Figure 1 is a lateral view of a sanding-smoothing machine, e.g. including two operative rollers carrying relative abrasive belt sleeves;
- Figure 2 is a perspective view of the operative rollers supporting the abrasive belt sleeves, showing the rotation direction of the operative rollers;
- Figure 3 is a perspective view of the sanding-smoothing machine, showing a removal step of one of the sleeves;
- Figure 4 is a perspective view of the sanding-smoothing machine including one operative roller and one tensing roller;
- Figure 5 is a front view of the particular A of Figure 4.

[0025] With reference to the above described figures, the reference numeral 2 indicates a machine for sanding-smoothing wooden floors P, including operative rollers, while the reference numeral 3 indicates a machine including only one operative roller.

[0026] The machine 2, with two operative rollers 6, 7, includes has abrasive belt sleeves 8, 9 mounted on the rollers, while the machine 3, equipped with one tensing roller 5 and one operative roller 50, includes has abrasive belt sleeve 55, whose dimensions are bigger with respect to the belts of the first machine, since it is trained around both rollers 5, 50 (Figure 5).

[0027] According to the proposed invention, the external part of the sleeves is made of abrasive paper,

whose grain is suitable for roughing-out and smoothing.

[0028] The inner part of the abrasive paper features a layer of soft material M, e.g. foam rubber, which is to be set in adherence onto each of the operative rollers 6, 7, 50.

[0029] The layer of the material M is applied to the inner surface of the paper by suitable adhesive means.

[0030] It is to be pointed out that foam rubber can be substituted by other materials of identical characteristics, such as fabric, cloth, natural or synthetic rubber, polyurethane foams or similar, or any kind of flexible material.

[0031] Moreover, it is possible to use air tube applied to the abrasive belt.

[0032] After having been set onto the operative roller, the so-obtained sleeve is inflated with a selected pressure, so as to obtain a particularly soft layer.

[0033] The layer of material M allows the sleeves to adhere perfectly to the surface of each operative roller, on which they are mounted, thus increasing the friction between the contact surfaces, and subsequently, the driving power the operative roller can exert on the sleeve.

[0034] This way, sleeves crumpling up and removal from each operative roller is avoided.

[0035] The softness and auto-modeling of the proposed sleeves allow to increase the area of contact with the floor P, actually the sleeve flattens in the working portion of the floor in relation to the pressure applied (see Figure 2).

[0036] Moreover, the pressure is uniformed in the whole contact area, so as to assure that the operative roller touches the floor along its whole length.

[0037] Moreover, it is possible to eliminate the inconvenient longitudinal lines on the floor resulting from the rigidity of the traditional sleeves and to improve the quality of finishing.

[0038] A perfect fastening of the sleeve to the operative roller, together with the sleeve softness, allow to optimize the working quality as well as productivity, due to the fact that no further smoothing operation with a single-brush machine is needed.

[0039] It is to be pointed out that the above described sleeves can be used for sanding-smoothing machines with either one working sleeve or two working sleeves; only the sleeves dimension change, so that they can adhere perfectly to the corresponding operative rollers.

[0040] It is understood that what above, has been described as a pure, not limitative example, therefore, possible variants of the invention remain within the protective scope of the present technical solution, as described above and claimed hereinafter.

Claims

1. Sleeve of abrasive material for sanding-smoothing machines including at least one operative roller

connected to a tensing roller, **characterized in that** it includes an external layer of abrasive material and an inner layer of a soft material (M) fixed to said external layer by suitable adhesive means, with said inner layer adhering to said tensing roller and to said operative roller of a sanding-smoothing machine.

2. Sleeve of abrasive material for sanding-smoothing machines including at least one operative roller, **characterized in that** it includes an external layer of abrasive material and an inner layer of a soft material (M) fixed to said external layer by suitable adhesive means, with said inner layer adhering to said operative roller of a sanding-smoothing machine.
3. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said inner and external layers take a flattened shape in a working area set in contact with the floor below.
4. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said soft material (M) is foam rubber.
5. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said soft material (M) is a fabric.
6. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said soft material (M) is cloth.
7. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said soft material (M) is natural or synthetic rubber.
8. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said soft material (M) is polyurethane foam.
9. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said soft material (M) is an air tune.
10. Sleeve of abrasive material, according to claim 1 or 2, **characterized in that** said soft material (M) is any kind of flexible material.

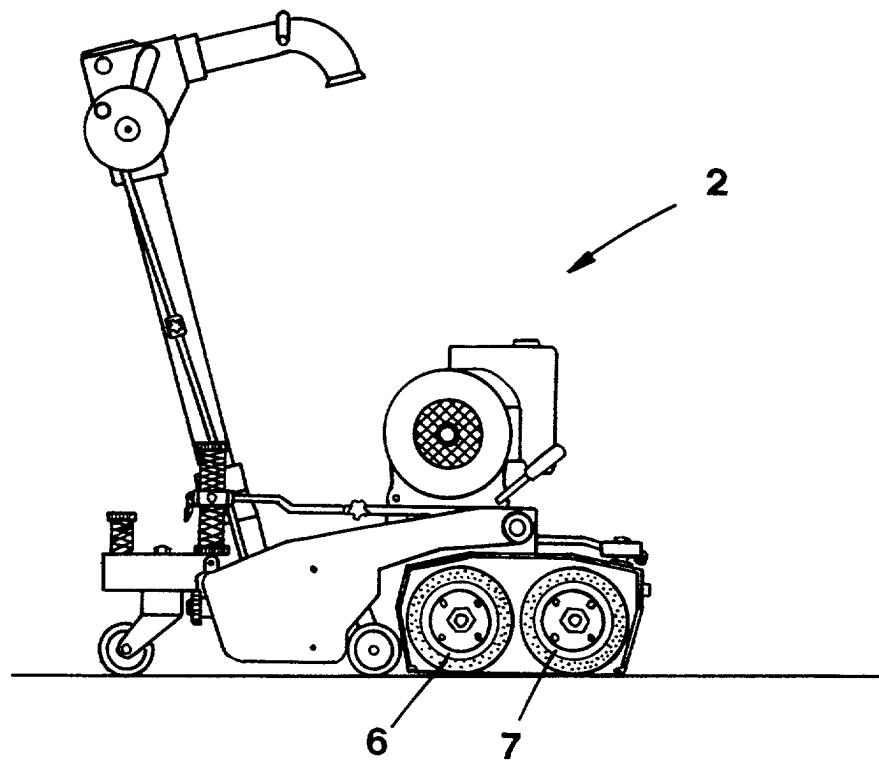


FIG. 1

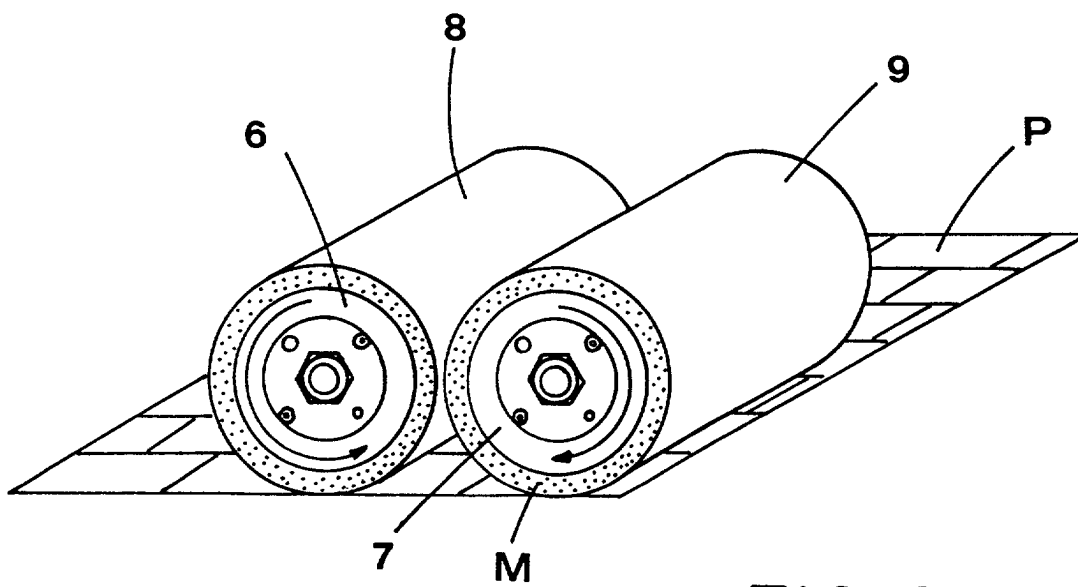


FIG. 2

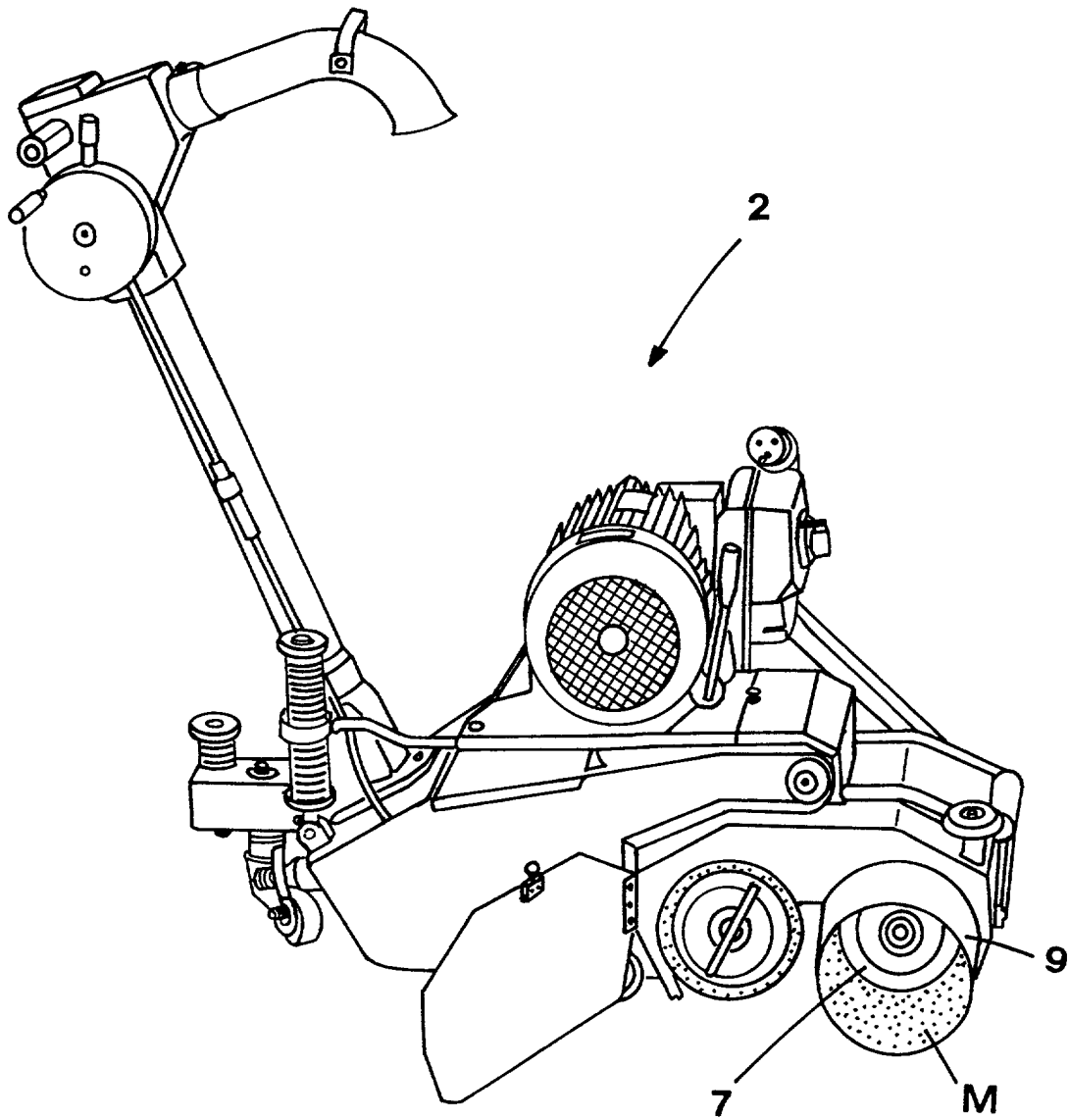


FIG. 3

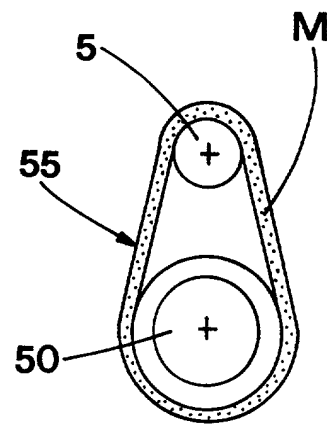


FIG. 5

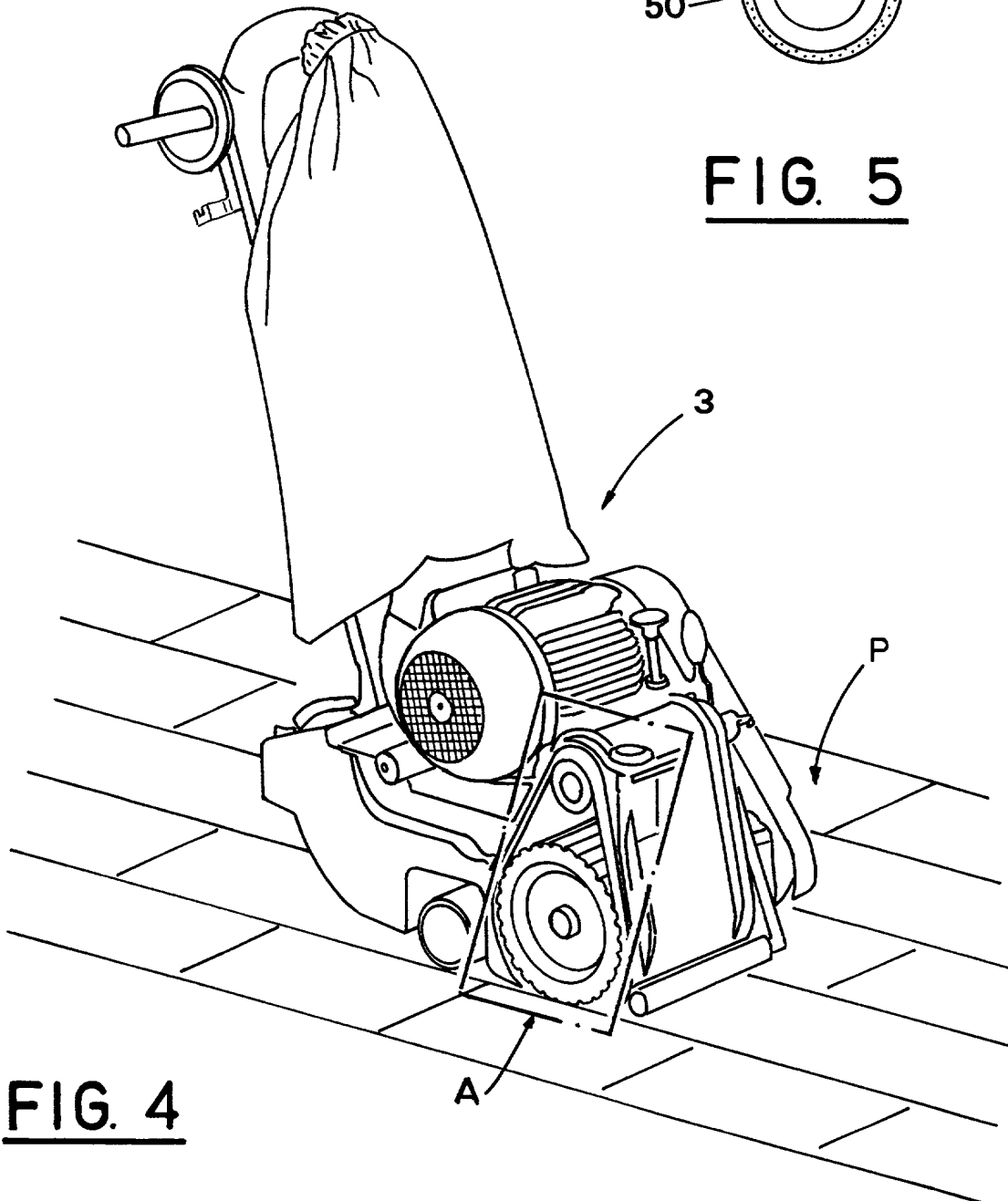


FIG. 4



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EUROPEAN SEARCH REPORT

Application Number
EP 00 12 3402

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
X	US 5 567 197 A (EVENSEN KENNETH) 22 October 1996 (1996-10-22)	2-4,10	B24D9/00 B24D11/02 B24B7/18
Y	* column 1, line 66 - column 2, line 31 * * column 7, line 41 - line 55 * * column 8, line 8 - column 9, line 52 * * column 11, line 40 - line 54 * * figures 12-15,17,18,23 * ---	1,5,6	
X	US 4 897 968 A (HUTT HEINZ) 6 February 1990 (1990-02-06) * column 1, line 5 - line 10 * * column 2, line 59 - column 3, line 8 * * figure 1 * ---	2,7,9,10	
X	US 5 419 087 A (HADDY CHARLES M) 30 May 1995 (1995-05-30) * column 1, line 5 - line 18; figures 1,2 * * column 5, line 33 - line 62 * ---	2,8,10	
Y	US 5 609 706 A (BENEDICT HAROLD W ET AL) 11 March 1997 (1997-03-11) * column 1, line 15 - line 37 * * column 7, line 13 - line 25 * * column 10, line 59 - column 11, line 5 * * column 25, line 4 - line 8 * * figures 1,2 * -----	1,5,6	TECHNICAL FIELDS SEARCHED (Int.CI.7) B24D B24B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 4 April 2001	Examiner Schultz, T
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03/82 (P04001)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 00 12 3402

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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