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Techniques for screen and spline replacement

Abstract

Embodiments described herein relate to techniques for spline and screen replacement. An example tool can include a handle. The tool can further include a body connected to the handle, the body including a curved first edge having a first tip at a first end, the first tip defined by the curved first edge and a second edge of the body, a third edge extending from the second edge to the handle, a second tip at a second end of the body, the second tip defined by the first edge and a fourth edge, and a fifth edge extending from the fourth edge to the handle.

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Background/Summary

BACKGROUND

(1) A window can include a screen and a spline for assisting with ventilation and keeping insects out of an enclosure, such as a home or office. A window screen can allow air to pass through a window frame while preventing insects from entering the enclosure. A spline can include a strip of flexible material that can be used to secure the window screen into a groove of the window frame. It can be desirable for improved techniques for replacement of a window screen and spline for a window frame.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

- (1) FIG. 1 is an illustration of an example screen and spline tool, according to one or more embodiments.
- (2) FIG. 2 is an illustration of an example screen and spline tool, according to one or more embodiments.
- (3) FIG. 3 is a cross-sectional illustration of an example screen and spline tool, according to one or more embodiments.
- (4) FIG. 4 is an illustration of a screen and spline tool rocking motion, according to one or more embodiments.
- (5) FIG. 5 is an illustration of an example screen and spline tool at a window frame angle, according to one or more embodiments.
- (6) FIG. 6 is an example process for fabricating a screen and spline tool, according to one or more embodiments.

DETAILED DESCRIPTION

- (7) The following description, various embodiments will be described. For purposes of explanation,

specific configurations and details are set forth in order to provide a thorough understanding of the embodiments. However, it will also be apparent to one skilled in the art that the embodiments may be practiced without the specific details. Furthermore, well-known features may be omitted or simplified in order not to obscure the embodiment being described.

(8) From time to time, a window screen and/or a spline may need to be replaced. The general replacement process can include removing the spline from a window frame groove. The spline can be a flexible material, such as rubber vinyl, and the like. It can be important to carefully remove the spline as not to damage the window frame. Once the spline has been removed, the window screen can be removed.

(9) The window frame can be cleaned to remove any debris, and a new window screen can be placed on the window, where the border of the window screen can overlap a groove of the window frame. The spline can be placed on top of the window screen above the groove. The spline can then be pressed into the groove to secure the window screen onto the window frame. For example, the groove can have a shape (e.g., rectangular, circular, or other shape), and the spline can be laid out on top of the window screen to have a rectangular shape that corresponds to the groove's shape. Beginning at one point, the spline can be pressed down into the groove, and continue to be pressed down into the groove along groove until the entire spline is pressed down into the groove to secure the window screen.

(10) In many instances, a conventional spline roller tool can be used to process the spline into the groove. Many conventional spline roller tools resemble pizza cutting rollers with a movable roller. One issues for the conventional spline roller tool is that motion required to press the conventional spline roller tool into the spline can require positioning the tool at an odd angle. Furthermore, at this odd angle, the rolling motion of the tool can be difficult to control, and the tool can easily roll out of the groove. Another issue can be that the conventional spline roller cannot adequately press a spline into a corner based on the amount of available space in a groove corner.

(11) The embodiments herein address the above-referenced issues by providing a techniques for pressing a spline into the groove of a window frame to secure a window screen. In some embodiments, a screen and spline replacement tool can include a hand-held tool with a handle connected to a body. The body can include an edge that is generally curved. The curved edge can include two edge tips at each end of the curve. The edge provides a contact area for pressing down on the spline, and the edge tips can be used to press the spline at the corners. Furthermore, the herein described tool can press the spline into the groove using a rocking motion, rather than the roller motion of the conventional spline roller tool.

(12) FIGS. 1, 2, and 3 are provided to illustrate an example tool to be used for window screen replacement from different viewing angles.

(13) FIG. 1 is an illustration **100** of an example screen and spline tool, according to one or more embodiments. The tool **102** can include a handle **104** and a body **106** to be used for pressing a spline into a groove of a window frame. The handle **104** can be used to grip the tool **102** for transporting the tool **102** or for using the tool **102** for spline and screen replacement. The handle **104** can be an ergonomically designed handle to be used to replace a window screen. The handle **104** can have a generally cylindrical shape to permit the handle **104** to be gripped. In some embodiments, the handle **104** can be fabricated to have length A **108**. For example, in some embodiments, the handle **104** can have length A **108** of five and one sixteenth inches (e.g., 5 and 1/16 of an inch), or within a threshold range (e.g., within one sixteenth inches) of this value. The handle can also have a width B **110**. In some instances, the width B **110** can be one inch (1 inch) or within the threshold range of this value. The body **104** can be fabricated from various materials, such as plastics, bioplastics, rubber, and other appropriate materials. It should be appreciated that although the illustrated handle **104** has a curved form, one having ordinary skill in the art can contemplate various other forms (e.g., a straight handle, a rigidly angled handle, or other handle form) that can be connected to the body **106**.

(14) The body **106** can be connected to the handle **104** and be used for spline and screen replacement. The body **106** can have a flat face or generally flat face. As illustrated, the body **106** can have a first edge **112** for pressing down on a spline into a groove of a window frame. As illustrated, the first edge **112** can be curved and the entire curvature can make contact with a spline. The curvature can enable the tool **102** to be used with a rocking motion indicated above. The rocking motion is described with more detail with respect to FIG. 4. In general, the tool **102** can make contact with a spline and be moved in a clockwise and counterclockwise motion as it is pressed into the spline. The width of the first edge **112** can be configured to permit the body **102** to be inserted into a groove of a window frame. For example, if the width of a groove is one half of an inch, the width of the first edge **113** can be less than one half of an inch.

(15) As illustrated, each end of the first edge **112** can have an edge tip. As illustrated, one end can include a first edge tip **114** and an opposite end can include a second edge tip **116**. As illustrated, the edge tips can be angular to form a pointed tip. In some embodiments, the angle can be an acute angle to permit each edge tip to be pressed into an angled groove of a window frame. For example, a second edge **118** and the first edge **112** can be joined to form an acute angle. In some embodiments, the second edge **118** and the first edge **112** can be joined to form a right angle. In yet other embodiments, the second edge **118** and the first edge **112** can be joined to form an obtuse angle. The second edge **118** can be fabricated to have a length C **122**. In some embodiments, the length C **122** can be one half of an inch (e.g., $\frac{1}{2}$ of an inch) or within the threshold range of this value. Although illustrated as an angle, in some embodiments, the edge tips can be curved. In these embodiments, the second edge **118** and the first edge **112** can generally form an acute angle, a right angle, or an obtuse angle. The body **106** can further include a third edge **120**. In some embodiments, the third edge **120** can extend from the second edge **118** to the handle **104**. As illustrated, the third edge **120** can be curved, or in other embodiments, the third edge **120** can be straight.

(16) The first edge **112** can also have a second edge tip **116**. In some embodiments, the angle formed by the first edge **112** and a fourth edge **124** can be an acute angle to permit each the second edge tip **116** to be pressed into an angled groove of a window frame. In some embodiments, the fourth edge **124** and the first edge **112** can be joined to form a right angle or an obtuse angle. Although illustrated as an angle, in some embodiments, second edge tip **116** can be curved. In these embodiments, the fourth edge **124** and the first edge **112** can generally form an acute angle, a right angle, or an obtuse angle. In yet other embodiments, one of the first edge tip **114** and the second edge tip **116** can be angled and the other edge tip can be curved. The body **106** can further include a fifth edge **126**. In some embodiments, the fifth edge **126** can extend from the fourth edge **124** to the handle **104**. As illustrated, the fifth edge **126** can be curved, or in other embodiments, the fifth edge **126** can be straight.

(17) The first edge tip **114** and the second edge tip **116** can be fabricated to be separated by a length D **128**. In some embodiments, the length D **128** can be five and three eighths of an inch or within the threshold range of this value. The body **106** can have a first radius E **130** extending from a center point to the first edge **112**. In some embodiments, the first radius E **130** can be three and eighty-one two hundred fifty sixths of an inch (e.g., 3 and $\frac{81}{256}$ of an inch) or within the threshold range of this value. The body **106** can further include a second radius F **132**. In some embodiments, the second radius F **132** can be two and three eighths of an inch (e.g., 2 and $\frac{3}{8}$ of an inch) or within the threshold range of this value.

(18) FIG. 2 is an illustration **200** of an example screen and spline tool, according to one or more embodiments. FIG. 2 presents the tool **102** from a different viewing angle than FIG. 1. The cylindrical shape of the handle **104** is illustrated in FIG. 2. Furthermore, it is illustrated, that the first edge **112**, the first edge tip **114**, the second edge tip **116**, the second edge **118**, the third edge **120**, the fourth edge **124**, and the fifth edge **126** can have a width that extends from the first body face **202** to the second body face **204**. In some embodiments, the width is a uniform width. In other

embodiments, each of the first edge **112**, the first edge tip **114**, the second edge tip **116**, the second edge **118**, the third edge **120**, the fourth edge **124**, and the fifth edge **126** can have a respective width. For example, the first edge **112** can have a length that extends from the first edge tip **114** to the second edge tip **116**. In some embodiments, the width of the first edge **112** can be a uniform width from the first edge tip **114** to the second edge tip **116**. To illustrate an example describing different widths, the respective widths of the third edge **120** and the fifth edge **126** can be different than the width of the first edge **112**. As indicated above, the tool **102** can be fabricated for the first edge **112** to have a width configured to fit within the groove of a window frame.

(19) For example, the body **106** can have a first body face **202** on one side and a second body face **204** on the opposite side. The first body face **202** and the second body space **204** can be spaced apart based on the edges, where the width of the faces can be based on a width of a groove of a window frame, as indicated above.

(20) FIG. 3 is an illustration of an example cross-section of a screen and spline tool, according to one or more embodiments. As illustrated, the body **106** can be inserted into the handle **104**. In some embodiments, a length G **302** of the body **104** can be inserted into the handle **106**. In some embodiments, the length G **302** can be one half of an inch (e.g., $\frac{1}{2}$ of an inch) or within the threshold range of this value. FIG. 3 illustrates the body **106** as having a first portion outside of the handle **104** that has a first thickness and a second portion inserted into the handle **104** that has a second thickness. It should be appreciated that in some embodiments, the body **106** can have a uniform thickness. The body **104** can include a channel **304** that includes a concave surface having a portion that recesses inward into the body **106**. The recessed portion can be fabricated to have a desired radius. For example, in some embodiments, the recessed portion can have a radius of seven one hundred twenty eights of an inch (e.g., $\frac{7}{128}$ of an inch), or within one sixteenth of an inch of seven one hundred twenty eights of an inch.

(21) The recessed portion can have a surface profile that compliments a surface profile of a spline **306**. For example, as illustrated, the spline **306** has a convex surface profile, whereas the recessed portion of the channel **304** has a concave surface profile. The complimentary surface profiles permit the channel **304** to securely hold the spline in place when pressed down upon. The complimentary profiles can also help prevent the channel **304** from sliding off of the spline **306** when pressed down upon. As indicated above, the conventional spline roller tools can be susceptible to rolling off of the spline. The herein described embodiments, can provide a channel **304** with a portion that has a surface profile that compliments the surface profile of the spline **306**. It should be appreciated that as illustrated the spline **306** and the channel **304** have complimentary rounded surface profiles. One having ordinary skill in the art can contemplate other complimentary profiles. For example, both the spline **306** and the channel **304** can have a triangular surface profile, jagged surface profile or some other appropriate surface profile. A combination of the surface profile of the spline **306** and the channel **304** can help secure the spline **306** and prevent the channel **304** from moving off of the spline **306**. Therefore, the tool **102** can be fabricated to have a channel **304** with a surface profile matching a spline surface profile.

(22) FIGS. 4 and 5 are provided to illustrate use of the tool **102** for screen replacement.

(23) FIG. 4 is an illustration of an example screen and spline tool rocking motion, according to one or more embodiments. As indicated above, the structure of the tool **102** permits a back and forth rocking motion to press a spline into the groove of a window frame. The spline can be arranged over a window screen to be pushed into the groove. The tool **102** is illustrated at different positions at different points in time.

(24) At T.sub.0 **402**, the tool **102** can be in an initial position, and slightly rotated to the left of an upright position. The tool **102** can be pressed down on a spline to push the spline into a groove of a window frame. The tool **102** can be rotated in a clockwise motion. The rotation can be along a horizontal axis of the tool **102**. As the tool **102** is rotated, the first edge **112** of the tool **102** can press down on the spline **306** causing more of the spline to be pressed into the groove and

consequently securing more of the windrow screen onto the window frame.

(25) At T.sub.1 **404**, the tool **102** can be in the upright position. The tool **102** can be further rotated in a clockwise motion. As the tool **102** is rotated, the first edge **112** of the tool **102** can press down on the spline **306** causing more of the spline to be pressed into the groove and consequently securing more of the windrow screen onto the window frame.

(26) At T.sub.2 **406**, the tool can be in slightly rotated to right of the upright position. The tool **102** can be rotated in a counterclockwise position, while sliding the tool **102** forward along the spline **306** to cause the first edge **112** to further press down and secure the window screen into the groove of the window frame.

(27) At T.sub.3 **408**, the tool **102** can be in the upright position and be rotated in a counterclockwise motion. The tool **102** can further be slid forward over the spline **306** to cause the spline **306** to press the window screen down into the groove of the window frame.

(28) At T.sub.4 **410**, the tool **102** can be slightly rotated to the left of the upright position, similar to the position at T.sub.0 **402**. The tool can be rotated in a clockwise motion causing the first edge **112** to push the spline **306** down over the window screen and into the groove of the window frame.

(29) At T.sub.5 **412**, the tool **102** can be in the upright position and the rotating motion described above can continue for pushing the spline **306** down onto the window screen and into the groove of the window frame. The motion can continue until the spline **306** has been completely pushed down into the groove, or until an angle of the groove has been reached. FIG. 5 describes a motion to the tool **102** in the event an angle has been reached.

(30) FIG. 5 is an illustration **500** of an example screen and spline tool at a window frame angle, according to one or more embodiments. As illustrated a screen **502** has been placed over a frame **504**. A spline **306** is placed on top of the screen **502** and over groove **506**. A tool **102** can be used to push the spline **306** down causing the spline **502** and the screen **502** to be secured in the groove **506**.

(31) At T.sub.0 **508**, the tool **102** can push the spline **306** down into the groove **506** as described with respect to FIG. 4. At T.sub.1, **510**, an angle **512** of the groove **506** can be reached. As indicated above, the conventional spline roller tool may not be able to accommodate an angle, as a roller may not be able to turn an angle based on the dimensions of the groove. The herein described embodiments describe a tool with edge tips. At T.sub.1 **501**, the tool **102** can be rotated to cause an edge tip (e.g., first edge tip **114**, second edge tip **116**) to press down on the spline **306** at the angle **512**. The edge tip can push the spline **306** down at the angle **512** to secure the screen **502** into the groove **506**.

(32) At T.sub.2, **514**, the tool **12** can be rotated over a vertical axis of the tool **102**. The rotation can cause the first edge **112** of the tool **102** to be aligned with the groove **506** of the frame **504**. The tool **102** can continue to be moved to cause the spline **306** to be pushed down over the screen **502** and into the groove **506**. This process can continue until the spline **306** and the screen **502** are secured into the groove **506**.

(33) FIG. 6 is an example process **600** for fabricating a screen and spline tool (e.g., tool **102**), according to one or more embodiments. At **602**, the process **600** can include fabricating a body (e.g., body **106**) to include a curved first edge (e.g., first edge **112**) have a first tip (e.g., first tip **114**) at a first end, the first tip defined by the first edge and a second edge (e.g., second edge **118**) forming an acute angle. The body can further include a third edge (e.g., **120**) extending away from the second edge, the first edge can be defined by a first radius (e.g., radius **E 130**), and the third edge can be defined by a second radius (e.g., second radius **132**) that is less than the first radius.

(34) The process **600** can further include determining a spline surface profile. For example, the process **600** can include determining whether a spline has a curved surface profile or a straight surface profile. The channel can be configured to compliment the spline surface profile. Therefore, the channel can be formed along the curved first edge to have a surface profile that compliments the spline surface profile.

(35) The process 600 can further include fabricating a handle (e.g., 104) and connecting the handle to the body. The handle can be connected to the body at an opposite end than the first edge. In some embodiments, the body and the handle can be fabricated from the same material. In other embodiments, the body and the handle can be fabricated from different materials. In some embodiments, the body and the handle can be integrally fabricated. In other embodiments, the body and the handle can be fabricated separately and then connected to form the screen and spline tool.

(36) The above description of certain examples, including illustrated examples, has been presented only for the purpose of illustration and description and is not intended to be exhaustive or to limit the disclosure to the precise forms disclosed. Modifications, adaptations, and uses thereof will be apparent to those skilled in the art without departing from the scope of the disclosure. For instance, any examples described herein can be combined with any other examples.

(37) Although specific embodiments have been described, various modifications, alterations, alternative constructions, and equivalents are also encompassed within the scope of the disclosure. Embodiments are not restricted to operation within certain specific data processing environments but are free to operate within a plurality of data processing environments. Additionally, although embodiments have been described using a particular series of transactions and steps, it should be apparent to those skilled in the art that the scope of the present disclosure is not limited to the described series of transactions and steps. Various features and aspects of the above-described embodiments may be used individually or jointly.

(38) The specification and drawings are, accordingly, to be regarded in an illustrative rather than a restrictive sense. It will, however, be evident that additions, subtractions, deletions, and other modifications and changes may be made thereunto without departing from the broader spirit and scope as set forth in the claims. Thus, although specific disclosure embodiments have been described, these are not intended to be limiting. Various modifications and equivalents are within the scope of the following claims.

(39) The use of the terms “a” and “an” and “the” and similar referents in the context of describing the disclosed embodiments (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms “comprising,” “having,” “including,” and “containing” are to be construed as open-ended terms (i.e., meaning “including, but not limited to,”) unless otherwise noted. The term “connected” is to be construed as partly or wholly contained within, attached to, or joined together, even if there is something intervening. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended merely to better illuminate embodiments and does not pose a limitation on the scope of the disclosure unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the disclosure.

(40) Disjunctive language such as the phrase “at least one of X, Y, or Z,” unless specifically stated otherwise, is intended to be understood within the context as used in general to present that an item, term, etc., may be either X, Y, or Z, or any combination thereof (e.g., X, Y, and/or Z). Thus, such disjunctive language is not generally intended to, and should not, imply that certain embodiments require at least one of X, at least one of Y, or at least one of Z to each be present.

(41) Preferred embodiments of this disclosure are described herein, including the best mode known for carrying out the disclosure. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. Those of ordinary skill should be able to employ such variations as appropriate and the disclosure may be practiced otherwise than as specifically described herein. Accordingly, this disclosure includes all

modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the disclosure unless otherwise indicated herein.

(42) All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

(43) In the foregoing specification, aspects of the disclosure are described with reference to specific embodiments thereof, but those skilled in the art will recognize that the disclosure is not limited thereto. Various features and aspects of the above-described disclosure may be used individually or jointly. Further, embodiments can be utilized in any number of environments and applications beyond those described herein without departing from the broader spirit and scope of the specification. The specification and drawings are, accordingly, to be regarded as illustrative rather than restrictive.

Claims

1. A device for window screen replacement, the device comprising: a handle; and a body connected to the handle, the body comprising: a curved first edge having a first tip at a first end, the first tip defined by the curved first edge and a second edge of the body, the curved first edge sized to fit in a groove of a window frame; a third edge extending from the second edge to the handle; a second tip at a second end of the body, the second tip defined by the curved first edge and a fourth edge; and a fifth edge extending from the fourth edge to the handle, wherein the curved first edge comprises a channel extending inward into the body.
2. The device of claim 1, wherein the channel has a curved surface profile complimenting a spline surface profile.
3. The device of claim 1, wherein the channel has a straight surface profile complimenting a spline surface profile.
4. The device of claim 3, wherein the second tip is defined by the curved first edge and the fourth edge forming an acute angle, a right angle, or an obtuse angle.
5. The device of claim 1, wherein the curved first edge is defined by a first radius, and wherein the third edge is defined by a second radius that is less than the first radius.
6. The device of claim 1, wherein the handle has cylindrical structure, and wherein the body is partially inserted into the handle, wherein the handle is connected to the body at an opposite end than the curved first edge.
7. The device of claim 1, wherein the first tip is defined by the first edge and the second edge forming an acute angle, a right angle, or an obtuse angle.
8. The device of claim 1, wherein the third edge had a curved surface profile.
9. The device of claim 1, wherein the third edge has a straight surface profile.
10. The device of claim 1, wherein the body comprises a first flat face and a second flat face opposite the first flat face.
11. A device for window screen replacement, the device comprising: a body comprising: a curved first edge having a first tip at a first end, the first tip defined by the curved first edge and a second edge of the body, the curved first edge sized to fit in a groove of a window frame; a third edge extending from the second edge, the curved first edge defined by a first radius, and the third edge defined by a second radius that is less than the first radius; and a second tip at a second end of the body, the second tip defined by the first edge and a fourth edge, wherein the curved first edge comprises a channel extending inward into the body.
12. The device of claim 11, wherein the first tip is defined by the curved first edge and the second edge forming an acute angle, a right angle, or an obtuse angle.
13. The device of claim 11, wherein the second tip is defined by the curved first edge and the fourth

edge forming an acute angle, a right angle, or an obtuse angle.

14. The device of claim 11, wherein the device further comprises: a handle connected to the body.

15. The device of claim 11, wherein the first tip is defined by the curved first edge and the second edge forming an acute angle, and wherein the second tip is defined by the curved first edge and the fourth edge forming a right angle.

16. The device of claim 11, wherein the channel has a curved surface profile or a straight surface profile.

17. A method for fabricating a screen replacement tool, the method comprising: fabricating a body to include: a curved first edge have a first tip at a first end, the first tip defined by the curved first edge and a second edge forming an acute angle; and a third edge extending away from the second edge, the curved first edge defined by a first radius, and the third edge defined by a second radius that is less than the first radius; determining a spline surface profile, and forming a channel along the curved first edge to have a surface a profile that compliments the spline surface profile.

18. The method of claim 17, wherein the method further comprises: fabricating a handle; and connecting the handle to the body.
