A screen frame includes a beam having a groove, a screen material to be attached onto the beam, and a spline member having two spring blades extended outwardly from a base panel and inclined relative to the base panel and having free end portions extended away from each other, for engaging into the groove of the beam, and for forcing and anchoring the screen material onto the beam. The spring blades each includes an anchor segment having the outer inclined surface for easily forcing the screen material into the groove of the beam, and one or more anchor portions to engage with projections of the beam, and to further anchor and retain the spring blades within the groove of the beam.
SCREEN FRAME HAVING SPRING SPLINE

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a screen frame, and more particularly to a screen frame including a spline member having two spring legs extended therefrom for solidly anchoring or securing screen materials to frames.

[0003] 2. Description of the Prior Art

[0004] Various kinds of typical screen frames have been developed and comprise a molded rubber or resilient spline member for engaging into grooves of frames, and for anchoring or securing screen materials to the frames.

[0005] For example, U.S. Pat. No. 2,897,889 to Kessler discloses one of the typical screen frames comprising a molded spline member of extruded plastic materials for engaging into grooves of frames, and provided with a number of knobs or protruberances extended outwardly from its surface, for penetrating through pores or apertures of screen materials, and for anchoring or securing the screen materials to the frames.

[0006] However, the molded spline members are normally made of extruded plastic or rubber materials which will not be solidly anchored or secured to the frames, and may have a good chance to be disengaged from the frames after use. In addition, additional tool members are required to force or to compress the resilient spline members into the grooves of the frames.

[0007] U.S. Pat. No. 3,220,469 to Oelmiig discloses another typical screen frame comprising a molded splined head extruded from a molding strip, for engaging into grooves of frames, and for anchoring or securing the screen materials to the frames. However, similarly, the molded spline heads are also made of extruded plastic or rubber materials which will not be solidly anchored or secured to the frames, and may have a good chance to be disengaged from the frames after use.

[0008] U.S. Pat. No. 3,879,894 to Anderson discloses a further typical screen frame comprising a flexible screen spline having an H-shaped cross section defining a parallelogram, for engaging into grooves of frames, and for anchoring or securing the screen materials to the frames. However, similarly, the molded spline heads are also made of extruded plastic or rubber materials which will not be solidly anchored or secured to the frames, and may have a good chance to be disengaged from the frames after use. Additional tool members are also required to force or to compress the resilient spline members into the grooves of the frames.

[0009] U.S. Pat. No. 3,991,806 to Abell, and U.S. Pat. No. 4,084,360 to Beckon further disclose two other typical screen frames each also comprising a flat or rounded screen spline for engaging into grooves of frames, and for anchoring or securing the screen materials to the frames. However, similarly, the molded spline heads are also made of extruded plastic or rubber materials which will not be solidly anchored or secured to the frames, and may have a good chance to be disengaged from the frames after use. Additional tool members are also required to force or to compress the resilient spline members into the grooves of the frames.

SUMMARY OF THE INVENTION

[0010] The present invention has arisen to mitigate and/or obviate the afore-described disadvantages of the conventional spline materials for screen frames.

[0011] The primary objective of the present invention is to provide a screen frame including a spline member having two spring legs extended therefrom for easily and solidly anchoring or securing screen materials to frames.

[0012] In accordance with one aspect of the invention, there is provided a screen frame comprising a beam including a groove formed therein, a screen material to be attached onto the beam, and a spline member including base panel, and two spring blades extended outwardly therefrom and inclined relative to the base panel and having free end portions extended away from each other, for engaging into the groove of the beam, and for forcing and anchoring the screen material onto the beam.

[0013] The spring blades each includes an outer inclined surface formed in the free end portion thereof, for engaging with the beam, and for allowing the spring blades to easily force and engage the screen material into the groove of the beam. The spring blades each includes an anchor segment extended inwardly from the free end portion thereof, having the outer inclined surface formed on the anchor segment.

[0014] The spring blades include at least one anchor portion formed on the free end portion thereof, and the beam includes at least one projection extended into the groove of the beam, to engage with the anchor portion of the spring blades, and to anchor and retain the spring blades within the groove of the beam.

[0015] The groove of the beam includes a wider inner portion and a narrower outer portion, to form two inclined surfaces therein, and to engage with the outwardly inclined spring blades. The inclined surfaces of the beam are preferably parallel to the outwardly inclined spring blades.

[0016] The beam includes an outer covering attached onto an outer peripheral portion thereof, to protect the beam. The beam includes an edge portion having a reduced thickness, to form a space therein, and to receive the base panel of the spline member.

[0017] Further objectives and advantages of the present invention will become apparent from a careful reading of the detailed description provided hereinafter, with appropriate reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. 1 is a plan schematic view of a screen frame in accordance with the present invention;

[0019] FIG. 2 is a partial exploded view of the screen frame;

[0020] FIG. 3 is a plan schematic view of a spline member of the screen frame; and

[0021] FIG. 4 is an enlarged partial cross sectional view of the screen frame, illustrating the operation of the spline member of the screen frame.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0022] Referring to the drawings, and initially to FIG. 1, a screen frame 10 in accordance with the present invention
comprises one or more, such as four beams 11 arranged in a square or rectangular shape or structure, and having a peripheral groove 12 formed therein (FIGS. 2, 4), for attaching or securing a screen material 20 onto the beams 11 of the screen frame 10 with one or more spline members 30.

[0023] As shown in FIGS. 2, 4, the groove 12 of the beam 11 includes a greater or wider inner portion 13, and a smaller or narrower outer portion 14, to form or define one or more inclined surfaces 15 therein, such as to form or define two inclined surfaces 15 in two sides the groove 12 of the beam 11, best shown in FIG. 4. It is preferable that either or both of the inclined surfaces 15 of the beam 11 each includes one or more projections 16 extended into the groove 12 of the beam 11.

[0024] The spline member 30 includes base panel 31, and one or more, such as two spring blades 32 extended therefrom and outwardly inclined relative to the base panel 31, and the spring blades 32 are also inclined relative to each other. It is preferable that the spring blades 32 include free end portions 33 extended outwardly and away from each other, for engaging into the groove 12 of the beam 11, and for forcing and anchoring the screen material 20 onto the screen frame 10.

[0025] It is preferable that the spring blades 32 each includes an anchor segment 34 extended inwardly from the free end portion 33 thereof, having an outer inclined surface 35 formed or provided thereon, for engaging with the beams 11, and for allowing the spring blades 32 of the spline member 30 to easily force and engage the outer peripheral portion of the screen material 20 into the groove 12 of the beams 11 of the screen frame 10.

[0026] It is further preferable that the spring blades 32 are parallel to the inclined surfaces 15 of the beam 11, to allow the spring blades 32 to be anchored and retained within the groove 12 of the beams 11, and to prevent the spring blades 32 of the spline member 30 from being disengaged from the groove 12 of the beams 11 of the screen frame 10, and thus to solidly anchor or secure the screen material 20 to the screen frame 10.

[0027] It is further preferable that the spring blades 32 each includes an anchor depression or portion 36 formed or provided on the free end portion 33 thereof, for engaging with the projections 16 of the beam 11, and for further solidly anchoring and retaining the spring blades 32 within the groove 12 of the beams 11, and for further preventing the spring blades 32 of the spline member 30 from being disengaged from the groove 12 of the beams 11 of the screen frame 10.

[0028] As shown in FIGS. 2 and 4, the beams 11 of the screen frame 10 may be made of wood materials, plastic or synthetic materials, or metal materials, such as made of recycled wood or plastic or metal materials, and may further include an outer covering 17 applied or attached onto the outer peripheral portion therein, for allowing the recycled materials to be enclosed and shielded by the outer covering 17.

[0029] As best shown in FIG. 4, the beam 11 includes a side portion or an edge portion 18 having a reduced height or thickness, to form or define a space 19 therein, and to receive the base panel 31 of the spline member 30, and to allow the base panel 31 of the spline member 30 to flush with the outer peripheral surface or outer contour of the beam 11 of the screen frame 10.

[0030] In operation, as shown in FIG. 4, the outwardly inclined spring blades 32 of the spline member 30 may force and engage the outer peripheral portion of the screen material 20 onto or against the inclined surfaces 15 of the beam 11, and may thus be used to solidly anchor or secure the screen material 20 to the screen frame 10. The formation or the provision of outer inclined surfaces 35 on the anchor segments 34 of the spring blades 32 allows the spring blades 32 to easily force and engage the outer peripheral portion of the screen material 20 into the groove 12 of the beams 11 of the screen frame 10.

[0031] The engagement of the anchor portions 36 of the spring blades 32 with the projections 16 of the beam 11 may further solidly anchor and secure the spring blades 32 within the groove 12 of the beams 11, and may prevent the spring blades 32 of the spline member 30 from being disengaged from the groove 12 of the beams 11 of the screen frame 10.

[0032] Accordingly, the screen frame in accordance with the present invention includes a spline member having two spring legs extended therefrom for solidly anchoring or securing screen materials to frames.

[0033] Although this invention has been described with a certain degree of particularity, it is to be understood that the present disclosure has been made by way of example only and that numerous changes in the detailed construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

I claim:

1. A screen frame comprising:
   a beam including a groove formed therein,
   a screen material to be attached onto said beam, and
   a spline member including base panel, and two spring blades extended outwardly therefrom and inclined relative to said base panel and having free end portions extended away from each other, for engaging into said groove of said beam, and for forcing and anchoring said screen material onto said beam.

2. The screen frame as claimed in claim 1, wherein said spring blades each includes an outer inclined surface formed in said free end portion thereof, for engaging with said beam, and for allowing said spring blades to easily force and engage said screen material into said groove of said beam.

3. The screen frame as claimed in claim 2, wherein said spring blades each includes an anchor segment extended inwardly from said free end portion thereof, having said outer inclined surface formed on said anchor segment.

4. The screen frame as claimed in claim 1, wherein said spring blades include at least one anchor portion formed on said free end portion thereof, and said beam includes at least one projection extended into said groove of said beam, to engage with said at least one anchor portion of said spring blades, and to anchor and retain said spring blades within said groove of said beam.
5. The screen frame as claimed in claim 1, wherein said groove of said beam includes a wider inner portion and a narrower outer portion, to form two inclined surfaces therein, and to engage with said outwardly inclined spring blades.

6. The screen frame as claimed in claim 5, wherein said inclined surfaces of said beam are parallel to said outwardly inclined spring blades.

7. The screen frame as claimed in claim 1, wherein said beam includes an outer covering attached onto an outer peripheral portion thereof, to protect said beam.

8. The screen frame as claimed in claim 1, wherein said beam includes an edge portion having a reduced thickness, to form a space therein, and to receive said base panel of said spline member.

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