

- [54] **MULTI POSITION ADJUSTABLE  
ROOFING KNIFE**  
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- [52] U.S. Cl. .... **30/320, 30/335**  
[51] Int. Cl. .... **B26b 1/08**  
[58] Field of Search.....30/162, 151, 320, 332, 335,  
30/337, 339

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**FOREIGN PATENTS OR APPLICATIONS**

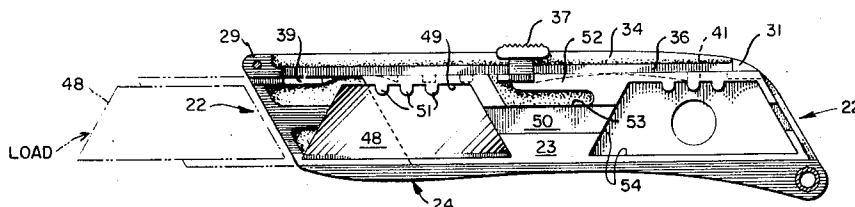
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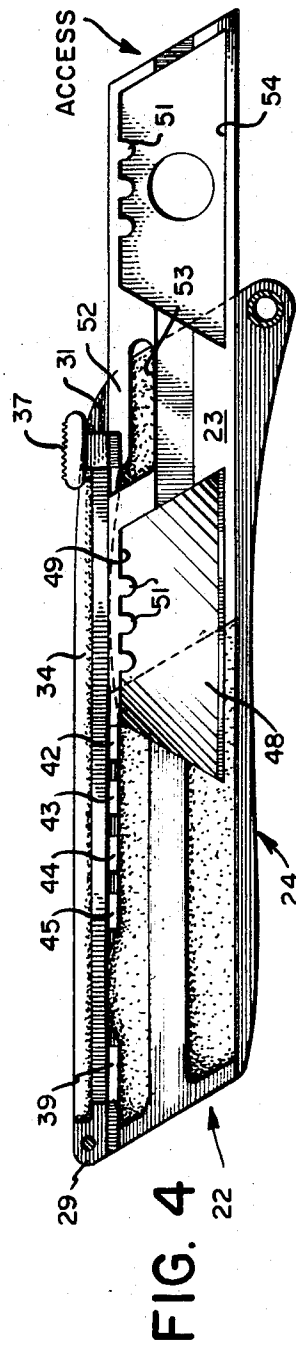
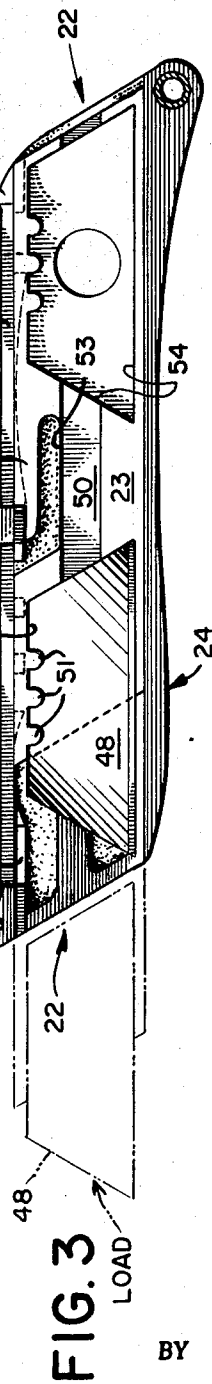
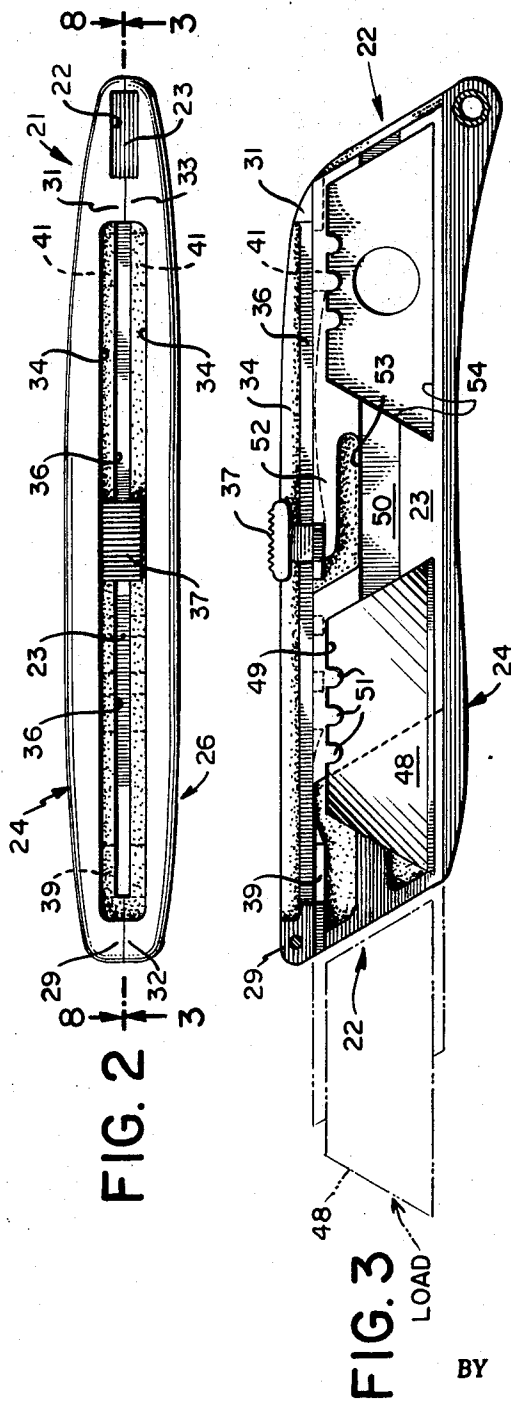
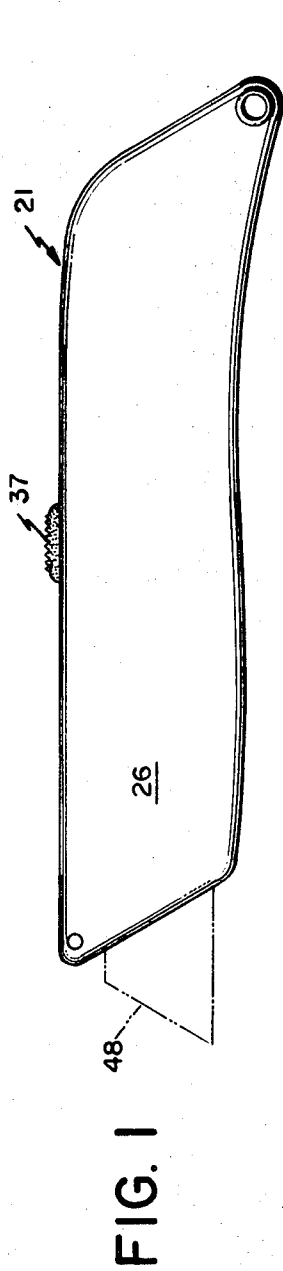
*Primary Examiner*—Robert C. Riordon  
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[57] **ABSTRACT**

A craftsman's utility knife or "roofing" knife with an elongated hollow casing slidably accommodating a bladeholder slider indexable between a retracted position and plurality of extended cutting positions, with an extreme protruding position for loading or changing blades at the cutting end of the slider and a reverse extreme access position for inserting and removing extra blades from a blade storage chamber at the opposite end of the slider.

**5 Claims, 12 Drawing Figures**





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FIG. 5

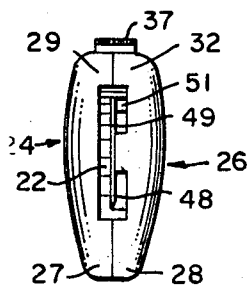


FIG. 7

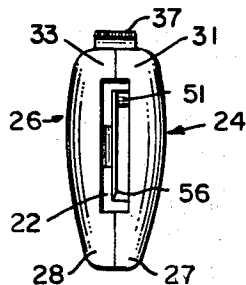


FIG. 6

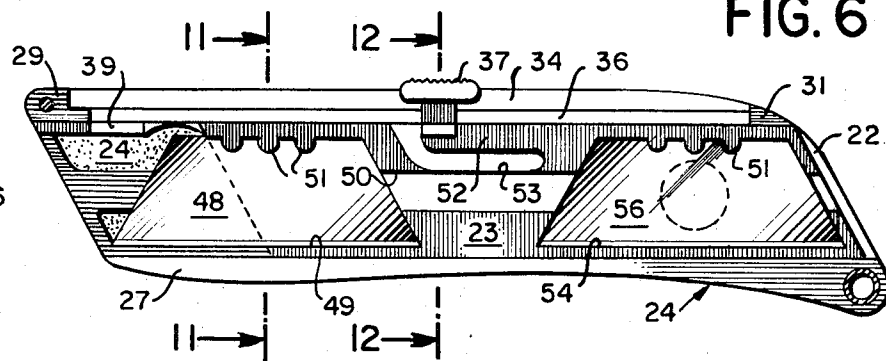


FIG. 8

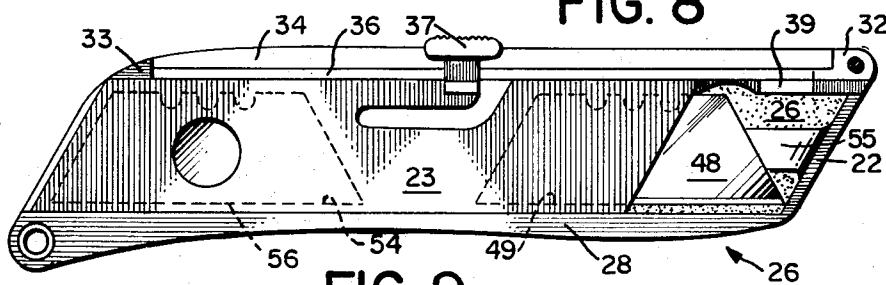


FIG. 9

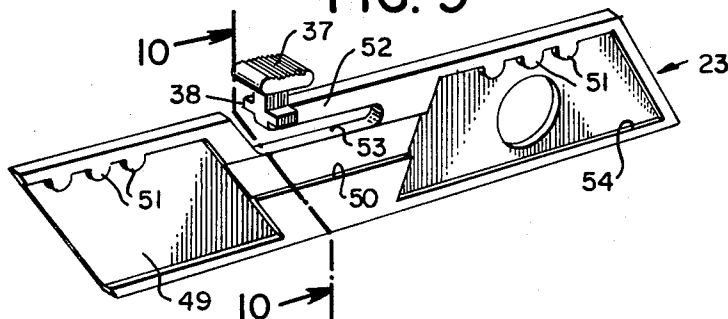


FIG. 11

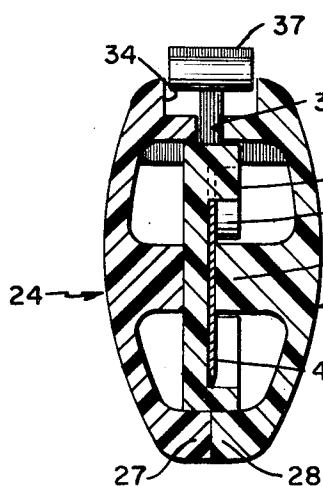


FIG. 12

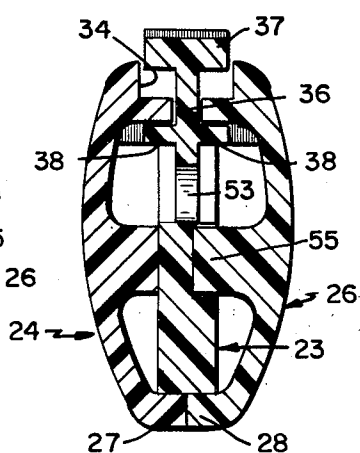
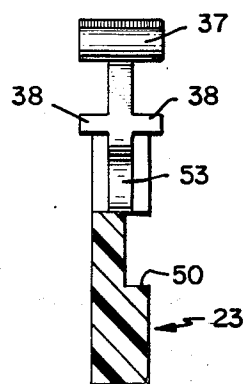


FIG. 10



## MULTI POSITION ADJUSTABLE ROOFING KNIFE

This invention relates to utility knives also known as "roofing" knives exposing the corner of a protruding trapezoidal blade extended from a conveniently shaped handle in protruding cutting position.

The knives of the present invention are designed to supplant craftsmen's knives with metal or plastic handles conventionally constructed in mating halves held together by a central transverse screw, with extra blades being stored inside the handle. Such conventional utility or roofing knives often provide a single cutting position for the blade rather than a selectable plurality of cutting positions, and then require manual screwdriver manipulation in order to remove a dull blade and replace it with a fresh one.

The utility knives of the present invention incorporate an indexing knob protruding upward from an elongated slot extending along the upper edge of the handle casing, and are conveniently manipulated by the user, merely by a simple movement of his thumb, depressing and indexing the indexing knob. The same indexing knob indexes the cutting blade between its various adjusted cutting positions, extends it fully for blade removal and exposes a blade storage chamber at the non-cutting end of the handle casing for insertion or removal of a stored fresh blade whenever required.

Accordingly, the principal object of the invention is to provide an economical and convenient utility knife manually indexable between a plurality of cutting positions, and another object is to provide convenient blade retraction; a further object of the invention is to provide such a utility knife affording convenient blade removal, storage and replacement whenever required.

Other and more specific objects will be apparent from the features, elements, combinations and operating procedures disclosed in the following detailed description and shown in the drawings.

## THE DRAWINGS

FIG. 1 is a side elevation view of a knife embodying the present invention;

FIG. 2 is a top plan view of the knife of FIG. 1;

FIG. 3 is a cross-section elevation view of the knife of FIGS. 1 and 2 taken along the line 3—3 of FIG. 2, showing different "indexed" blade positions;

FIG. 4 is a corresponding cross-sectional elevation view along the same plane, indicated by the arrows 3—3 in FIG. 2;

FIG. 5 is a front end elevation of the knife of FIGS. 1—4;

FIG. 6 is a sectional side elevation view of the same embodiment taken along the line 3—3 of FIG. 2, showing the retracted mode of the device;

FIG. 7 is a rear end elevation view of the same device;

FIG. 8 is a cross-sectional side elevation view opposite that of FIG. 6 along the same plane viewed in the directions 8—8 in FIG. 2, showing the opposite side of the slider member of the device in its retracted position;

FIG. 9 is a perspective view of the reciprocable slider member of the device;

FIG. 10, 11, and 12 are successive cross-sectional end elevation view, respectively taken along the plane 10—10 shown in FIG. 9, and the successive plans 11 and 12 shown in FIG. 6.

The preferred embodiment of the invention illustrated in the drawings is a craftsman's knife comprising two slidably engaged parts, a hollow handle casing 21 incorporating a longitudinal central slideway 22 open at both ends, and a bladeholder slider 23 engaged for forward and backward reciprocable sliding motion within slideway 22 in handle casing 21.

## HOLLOW HANDLE CASING

The handle casing 21 is formed as a hollow, open-ended flattened tubular structure, which may be fabricated by combining two facing side members, a right side member 24 shown in FIGS. 3, 4, and 6 and a left side member 26 shown in FIG. 8. One or both of these side members 24 and 26 is provided with projections extending toward the opposite side member and embracing the central slideway 22, and the side members are preferably formed of molded polymers and sealed together by ultrasonic welding techniques or other bonding methods.

In the embodiment shown in the drawings each of the side members 24 and 26 is provided with a protruding lower flange, designated 27 and 28 respectively. Flanges 27 and 28 extend along the full length of the casing 21 and are joined together in abutting bonded engagement throughout substantially this entire length to form a floor underlying the slideway 22 and supporting the slider 23 for longitudinal sliding engagement.

Each of the side members 24 and 26 is also provided with an overlying outermost corner projection at each end thereof, extending lengthwise for only a short distance along the length of the casing 21. As shown in FIGS. 3 and 6, the right side member 24 is thus provided with a front land 29 and a rear land 31 extending inwardly to embrace the portals of the slideway 22. The left side member 26 is provided with a corresponding front land 32 and rear land 33, shown in FIG. 8.

The facing front lands 29 and 32 are bonded in facing abutting engagement by ultrasonic welding or other bonding techniques, and the rear lands 31 and 33 are likewise bonded in abutting engagement, thus forming with the bonded lower flanges 27—28 enclosed portals respectively encircling the open ends of the slideway 22 at the front and rear ends of casing 21, as shown in FIGS. 5 and 7 respectively.

A projecting ledge 34 overlying slideway 22 extends part way across the width of the casing 21, extending inwardly from the upper edge of each side member 24 and 26. Projecting ledges 34 on the side members 24 and 26 are formed as substantial "mirror images" of each other, as indicated in FIGS. 3 and 4 and also in FIGS. 6 and 8. The ledges 34 extend lengthwise along the entire length of casing 21 from the front lands to the rear lands; being shallower than these lands, the ledges 34 define between themselves a control slot 36 likewise extending along the entire length of the casing 21 between the front and rear lands, as shown in FIG. 2.

## INDEXING NOTCHES

Concavely recessed upwardly in the lower edge of the projecting ledge 34 on each side of the casing 21 are a series of index notches, cooperating with a manually depressible resilient index knob 37 extending upwardly through control slot 36 from the upper portion of the slider 23. The knob 37 is provided with up-

wardly facing shoulders 38 normally extending upwardly into telescoping engagement with the index notches, and downwardly depressible therefrom by manual pressures applied to knob 37 to facilitate reciprocable sliding longitudinal movement of the slider 23 within slideway 22.

The indexing notches include a loading notch 39 positioned close to the front lands 29-32, an access notch 41 close to the rear lands 31-33, and a serially arrayed plurality of cutting notches 42-45.

The notches 42-45 are successively arrayed from an innermost position for notch 42, in which the shoulders 38 engage to position the slider 23 within casing 21 shielding the cutting blade 48 fully enclosed within casing 21, to an extreme forwardmost notch 45 exposing about half the length of cutting blade 48 extending from casing 21 beyond the front end portal of slideway 22 for maximum cutting extension, as shown in FIG. 1.

In the position shown in FIG. 3, the blade 48 is positioned within a recessed blade cavity 49 formed at the front end of slider 23 on the side thereof facing the left side member 26 and having a depth just sufficient to accommodate the thickness of the blade 48. Cavity 49 has anchoring keys or lands 51 extending downward from its upper rim to engage corresponding, blade positioning notches formed in the blade 48, longitudinally anchoring the blade 48 within the slider 23 in the blade holder casing 21. Longitudinal sliding movement of slider 23 within slideway 22 thus carries blade 48 firmly anchored to slider 23 in firm integral engagement therewith.

#### BLADEHOLDER SLIDER

Successive positions of the slider 23 within slideway 22 in casing 21 are shown in the various views of the drawings. In the access position shown in FIG. 4, the slider 23 is moved rearwardly to its maximum extent with its control knob 37 and shoulder 38 abutting the inner end of the rear lands 31 and 33.

As shown in FIG. 4 and FIG. 9, the control knob 37 is formed protruding upwardly from the free end of a cantilever arm 52 extending longitudinally over a lengthwise slot 53 formed in the body of slider 23. The slider is preferably formed of resilient materials such as high-impact rubber-modified polystyrene, and for best performance and maximum useful life the slider should be formed of "ABS" plastic material, acrylonitrile butadiene styrene.

When formed of this material, downward thumb pressure applied by the user on knob 37 resiliently depresses the arm 52 lowering the upwardly facing shoulders 38 flanking knob 37 beneath the lower ends of the slots 39-45 to permit free lengthwise sliding movement of slider 23 within slideway 22. Upon release of the knob 37, the normal elastic resilience of arm 52 restores this arm to its upward position, bringing the shoulders 28 into engagement with any overlying notch in the ledges 34 for indexed positioning of the slider 23.

In the FIG. 4 access mode position of slider 23, fully extended rearwardly, a blade storage cavity 54 formed in slider 23 facing left side member 26 is exposed for removal of stored blades 56 therefrom by lifting and disengaging uppermost blade 56 from the anchoring keys or lands engaging its upper notches at the upper

periphery of the blade storage cavity 54. As shown in FIGS. 3, 4, 6 and 9, the blade storage cavity 54 is provided with a peripheral bounding rim completely encircling stored blades 56, serving to shield their cutting edges against inadvertent contact.

Depression of knob 37 and forward motion of slider 23 moves the slider telescopically within casing 21, concealing the stored blades 56. When shoulders 38 reach notch 42 in the position shown in FIG. 8, the cutting blade 48 and the stored blades 56 are all concealed within the casing 21. A groove 50 in slider 23 engages a longitudinal rib 55 extending from left side member 26 into slideway 22 and cavities 49 and 54, securing the blades therein.

When shoulders 38 reach the next indexing notch 43, a small triangular corner of blade 48 extends from the forward portal end of slideway 22, and successive positioning of shoulders 38 in notches 43-45 exposes successively longer portions of the cutting edge of cutting blade 48 from the front portal end of casing 21. The outermost cutting position of the blade 48, extended to its maximum extent by engagement of shoulders 38 within the indexing notches 45 of ledges 34, is illustrated in FIG. 1. Subsequent depression of knob 37 followed by further forward movement of slider 23 exposes substantially the entire length of cutting blade 48 as the slider moves to its loading mode position with shoulders 38 (FIG. 3) engaged in loading notch 39, permitting the removal of blade 48 by its lateral disengagement from blade holding cavity 49, permitting substitution of a fresh blade whenever desired by the user.

Depression of knob 37 and rearward sliding movement of slider 23 within slideway 22 thereafter brings the slider to any adjusted position desired.

While multiposition indexable sliding blade knives have been proposed in the past, convenient manually-operable craftsman's bladeholder knives formed of such material as "high impact," rubber-modified polystyrene or "ABS" offering the advantages of convenient indexing for blade loading and unloading, for indexed blade positioning and retraction and for access to blade storage at the opposite end of the blade holder casing afford unique advantages of convenience and simplicity of quick manual operation by the user, without danger of inadvertent injury to persons or materials.

The convenience of the manually depressible control knob indexing provided by the devices of this invention is coupled with convenience and economy of manufacture, since the parts of the preferred embodiments of this invention are easily fabricated from polymer strip stock utilizing inexpensive forming operations and ultrasonic welding assembly techniques. As a result, convenience and economy are combined with sturdy construction and long useful life to produce a novel and highly useful hand tool.

Since the foregoing description and drawings are merely illustrative, the scope of the invention has been broadly stated herein and it should be liberally interpreted to secure the benefit of all equivalents to which the invention is fairly entitled.

What is claimed is:

1. A manually indexable blade holder assembly comprising:

- A. an elongated open-ended hollow tubular casing provided with a longitudinal slideway extending therethrough from an open front portal to an open rear portal and having a longitudinal slot opening outwardly therefrom through the upper portion of the casing;
- B. a unitary bladeholder slider movably positioned in the slideway for longitudinal sliding engagement therewith and having a bladeholder cavity at a forward end for anchoring engagement of a cutting blade in variably extended projection from the forward end of the casing in each of said plurality of adjusted positions of the slider, and a blade storage cavity at a rearward end for storing a cutting blade therein, said storage cavity being provided with a peripheral bounding rim encircling the edge of a blade stored therein to shield its cutting edge against inadvertent contact;
- C. an upwardly facing shoulder formed on the slider and resiliently depressible by force applied through the longitudinal slot; and
- D. a plurality of downwardly facing concave index notches formed in the casing opening toward the slideway and positioned for engagement with the shoulder of the bladeholder slider in a plurality of different adjusted positions of the slider in the

slideway.

2. The assembly defined in claim 1, wherein the slider shoulder is formed on a depressible control knob protruding outwardly through the casing slot, whereby force applied to depress the control knob disengages the shoulder from the index notches.

3. The assembly defined in claim 1, wherein the slider is provided with a resiliently depressible arm incorporating the shoulder and terminating in a control knob protruding outwardly through the casing slot, whereby force applied to the control knob resiliently depresses the arm disengaging the shoulder from the index notches.

4. The assembly defined in claim 1, wherein the casing is provided with a forward terminal index notch positioned for engagement with the shoulder at an adjusted terminal position of the slider exposing the bladeholder cavity for insertion of a cutting blade therein or its removal therefrom.

5. The assembly defined in claim 1, wherein the casing is provided with a rearward terminal index notch positioned for engagement with the shoulder at an adjusted terminal position of the slider exposing the blade storage cavity for removal of a stored cutting blade therefrom or its insertion therein.

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