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P.G.DIPLOMA IN PATENTS LAW

2014-15

Paper II – Practical

(Exploitation of Patents – Drafting, Specification & Patent Writing)

Time: 2 ½ hours. **TOTAL MARKS: 90**

INSTRUCTIONS TO CANDIDATES

1. **The questions to be interpreted as given and no clarification can be sought from the invigilator.**
2. **Do not draw or attach figures**
3. **Do not write detailed description or figure no.s**
4. **The claim drafting will carry 60 marks**
5. **The rest of the specification will carry 30 marks**
6. **Attempt only one choice – either A or B**

Draft a Patent based on the information given by the inventor as below:

Option A

Temporary seating offers convenience due to the ability to be collapsed or folded into a compact configuration for portability and storage. One style of temporary seating generally referred to as a "camp chair" has gained considerable popularity for outdoor activities due, in part, to light weight and excellent portability. Some of the various activities where a camp chair may find use include sitting around a camp fire, watching a sporting event, waiting in a hunting blind, or fishing from a bank. While the sidelines of a soccer field may be relatively flat and even, the bank near a good fishing spot may be steeply inclined and/or uneven. A conventional camp chair is not well suited to be used on inclined or uneven surfaces. Additionally, the collapsible support structure of a conventional camp chair that allows the chair to collapse and become portable also dictates that the seating area remain stationary and facing in one direction. During a sporting event, the location of the action may frequently change position relative to the field of view of the spectator or the action may be concentrated in a single location for substantial periods of time punctuated by occasional and brief changes in position. In either case, the spectator will generally position the chair facing the playing field and shift in the seat to follow the action. In a special case of a sporting event where the spectator may be centrally located and the action occurs around the spectator, such as a stock car race, the spectator will be unable to easily observe the action occurring behind the spectator if the spectator remains in the chair.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a perspective view of one embodiment of the camp chair in the operable seating configuration with an optional accessory;

FIG. 2 shows an exploded view of one embodiment of the swivel assembly of the camp chair;

FIG. 3 shows a top plan view of one embodiment of the bottom member of the swivel assembly of the camp chair;

FIG. 4 shows a top plan view of one embodiment of the upper member of the swivel assembly of the camp chair;

FIG. 5 shows a sectional side elevation view of one embodiment of the upper member of the swivel assembly of the camp chair taken along section line 5-5 of FIG. 4; and

FIG. 6 shows one embodiment the camp chair in the portable compact configuration.

DETAILED DESCRIPTION

A camp chair that levels to accommodate uneven ground and swivels, according to the present invention is described herein with reference to the accompanying figures. In the various embodiments, the camp chair includes a swivel assembly between the seat and the legs. The camp chair collapses into a compact portable configuration for transportation and expands into an operable seating configuration. The length of each leg is individually adjustable to allow leveling of the camp chair for use on an uneven or inclined surface. The camp chair optionally includes attachment points for connecting accessories. The swivel assembly allows the seat and any attachments to rotate freely about the vertical axis of the camp chair.

FIG. 1 illustrates a perspective view of one embodiment of the camp chair 100 in the operable seating configuration. The camp chair 100 includes an upper frame, a lower frame, a swivel assembly 102, and a seat 104. The swivel assembly 102 generally includes a top member 106a and bottom member 106b configured to rotate independently of each other. The swivel assembly 102 operatively connects the upper frame to the lower frame, which allows the upper frame and the lower frame to rotate independently. The upper frame includes a number of arms 110a, 110b connected to the top member 106a of the swivel assembly 102. In one embodiment, the arms 110a, 110b include a pair of front arms 110a and a pair of rear arms 110b. In the illustrated embodiment, the seat 104 includes a seating surface 112, a backrest 114, and a pair of armrests 118. The backrest 114 and the armrests 118 are both optional and one or both may be omitted as desired. Each front arm 110a engages the seat 104 proximate to the front corners of the seating surface 112 and engages each armrest 118 proximate to the front edge of the armrest 118. Each rear arm 110b engages the seat 104 proximate to the rear corners of the seating surface 112 at a location behind the intersection of the seating surface 112 and the backrest 114 and engages the backrest 114 proximate to the top corners of the backrest 114. The seat 104 is attached to each of the arms 110a, 110b in a manner that generally precludes the non-destructive removal of the seat 104 from the camp chair 110. The attachment of the seat 104 to four arms 110a, 110b reduces the amount of force applied to each point of attachment and also allows the seating surface 112 to generally assume a traditional quadrilateral shape.

The lower frame includes three or more legs 120 that are connected to the bottom member 106b of the swivel assembly 102 and cooperatively interface with the support surface, such as the ground or a floor, to support the camp chair 100. The camp chair 100 is easily leveled when engaging the support surface at only three points. In the illustrated embodiment, the camp chair 100 includes three legs 120 that are substantially linear. Each leg 120 is pivotally connected to the swivel

assembly 102 and oriented at an angle of approximately 120.degree. relative to the other legs 120. To place the chair in the operable seating configuration, each leg 120 is moved from the collapsed position in alignment with the vertical axis of the swivel assembly 102 to a support position. When in the support position, the legs 120 cooperatively form a tripod that supports the camp chair 100. Each leg 120 is oriented to form an acute angle with the vertical axis of the swivel assembly 102. The size of the angle between the legs 120 and the vertical axis of the swivel assembly 102 is selected to balance stability, which is directly proportional to the angle between the legs 120 and the vertical axis of the swivel assembly 102, with load capacity, which is inversely proportional to the angle between the legs 120 and the vertical axis of the swivel assembly 102.

FIG. 1 shows a side table accessory 150 suitable for attachment to the camp chair 100 at one of the optional attachment points 134 on the swivel assembly 102 The attachment points 134 are components of the swivel assembly 102 and need not be included in all embodiments of the camp chair 100. Attachment points 134 located on the upper member allow the accessory to rotate with the seat 104. Attachment points 134 located on the bottom member allow the accessory to remain stationary while the seat 104 rotates. The accessory generally includes a functional portion supported by an accessory arm 152. One end of the accessory arm 152 includes a mounting plate 154 configured to be selectively secured to one of the attachment points 134. Examples of accessories 150 include, but are not limited to, the side table shown in FIG. 1, a camera mount, a fan, an ***umbrella*** mount, a gun rest, a fishing rod mount, a television or radio mount. In one embodiment, the accessory is directly attached to the accessory arm. In an alternate embodiment, the accessory is selective attachable to the accessory arm allowing different types of accessories to be used without having to switch out the entire accessory and accessory arm assembly. In some embodiments, the accessory 150 is supported by more than accessory arm 152. In other embodiments, the accessory arm mounts to more than one attachment point 134.

FIG. 2 illustrates an exploded view of one embodiment of the swivel assembly 102 of the camp chair 100. The swivel assembly 102 bears the primary responsibility for maintaining the proper position of each front arm 110a, each rear arm 110b, and each leg 120 when the camp chair 100 is in the operable seating configuration. The swivel assembly 102 includes a rotary bearing 200 disposed between the top member 106a and the bottom member 106b. The rotary bearing 200 facilitates rotation by reducing friction between the top member 106a and the bottom member 106b. In one embodiment, the rotary bearing 200 is a ball thrust bearing. In the illustrated embodiment, the top member 106a and the bottom member 106b cooperatively define an optional raceway 202 to receive the rotary bearing 200. Other types of rotary bearings including, but not limited to, roller thrust bearings, fluid bearings, and magnetic bearings are also functionally suitable but may be commercially less desirable due to increased cost or other factors.

The top member 106a and bottom member 106b are operatively connected by a fastener positioned at the vertical axis of the swivel assembly 102. At least the top member 106a freely rotates about the fastener. This allows the seat 104 to rotate relative to the base of the camp chair 100. In one embodiment, the fastener includes an elongated member 204, which passes through an axial opening 206a in each of the top member 106a aligned with an axial opening 206b in the bottom member 106b and one or more capturing parts 208, which dimensioned larger than the central openings. The capturing parts 208 cooperate with the elongated member 204 to secure the top member 106a, the bottom member 106b, and the rotary bearing 200 together while allowing the top member 106a and, optionally, the bottom member 106b to freely rotate about the elongated member 204. An exemplary embodiment of such arrangement employs a nut and bolt to secure the top member 106a to the bottom member 106b. In an alternate embodiment, the fastener passes through the axial opening in one of the top member 106a and the bottom member 106b but directly connects

to the other member. In such an embodiment, only one member would freely rotate about the fastener. An exemplary embodiment of such an arrangement employs a lag bolt with the threaded portion of the bolt engaging the threaded opening of the member. Another example of such arrangement is achieved by welding one end of the fastener to one of the top member 106a and the bottom member 106b. A still further example of such arrangement employs an integrally formed and centrally positioned elongated member extending from one of the top member 106a and the bottom member 106b rather than a separate part.

FIG. 3 illustrates a top plan view of one embodiment of the bottom member 106b of the swivel assembly 102. The bottom member 106b defines a number of leg channels 300 corresponding in number to the number the legs 120. Each leg channel 300 limits the movement of and provides lateral support for one of the legs 120. In the illustrated embodiment, three leg channels 300 extend radially from the center of the swivel assembly 102. Each of the three leg channels 300 is oriented at an angle of approximately 120.degree. relative to the adjacent leg channels 300. The end wall 302 at the radial end of each leg channel 300 serves as a stop that defines the limit of outward movement for the leg 120 and, thereby, sets the angle between the leg 120 and the vertical axis of the swivel assembly 102 when the camp chair 100 is in the operative seating configuration.

In an alternate embodiment, the camp chair 100 includes four legs that are shaped substantially similar to the rear arms 110b illustrated in FIG. 2; however, the four legs may vary dimensionally from the rear arms 110b. The length of the third linear member is adjustable in a manner similar to that previously described. Each of the four legs is oriented at an angle of approximately 90.degree. relative to the adjacent legs. In order to accommodate the additional leg, the bottom member has channels arranged substantially similar to the top member 106a illustrated in FIG. 4. The addition of a leg decreases the percentage of weight carried by each leg and generally improves both stability and load capacity. However, each additional leg adds an additional point of contact that complicates the leveling process.

FIG. 4 illustrates a top plan view of one embodiment of the top member 106a of the swivel assembly 102. The top member 106a is structurally and functionally similar to the bottom member 106b. The top member 106a defines a number of arm channels 400, which open upwardly and correspond in number to the number the arms 110a, 110b. Each arm channel 400 limits the movement of and provides lateral support one of the front arms 110a or the rear arms 110b. In the illustrated embodiment, four arm channels 400 extend radially from the center of the swivel assembly 102. Each of the four arm channels 400 is oriented at an angle of approximately 90.degree. relative to the adjacent arm channels 400. In the illustrated embodiment, each attachment point 134 includes a number of fastener receptacles, e.g., threaded holes, which operatively engage the fasteners that securely mount the mounting plate 154 of the accessory arm 152 to the swivel assembly 102.

FIG. 5 illustrates a sectional side elevation view of one embodiment of the top member 106a of the swivel assembly 102. The end wall 402 serves as a stop that defines the outer limit movement for the arm 110a, 110b. When in the support position, the arm 110a, 110b engages the end wall 402 of the arm channel 400. The end walls 402 support the arms 110a, 110b in the desired position when the camp chair 100 is in the operative seating configuration and allow the arms 110a, 110b to resist the forces applied when a user occupies the camp chair 100. The camp chair 100 does not rely on the seat 104 to support the arms 110a, 110b. More particularly, the end walls 402 effectively limit the forces applied to the attachment points of the seat 104 during use because the position of the arms 110a, 110b remains fixed by the engagement of the arms 110a, 110b with the end walls 402. In one embodiment, at least a portion 500 of the end wall 402 is sloped or chamfered to reduce the

force per unit area exerted on the arm 110a, 110b by increasing the surface area of the end wall 402 in contact with the arm 110a, 110b. In another embodiment, the sloped or chamfered portion of the end wall is generally concave with an inside radius complementary to the outside radius the arm in order to further increase the surface area of the end wall in contact with the arm. It should be appreciated that end walls of the bottom member 106b are functionally and structurally similar to end walls of the top member 106a. FIG. 5 also illustrates one arm of the camp chair 100 in phantom to illustrate the pivotal movement around a pivot pin 502 between the portable compact configuration 504a and the operative seating configuration 504b. For clarity, the phantom arm in the operative seating configuration 504b is shown slightly offset from the sloped portion 500 of the end wall 402. Those skilled in the art will appreciate that the arm would directly engage the sloped portion 500 of the end wall 402 when in the operative seating configuration 504b.

FIG. 6 illustrates one embodiment the camp chair 100 in the portable compact configuration. In the portable compact configuration, the arms 110a, 110b and legs 120 are pivoted toward the central longitudinal axis of the swivel assembly 102. Once collapsed into the portable compact configuration, the camp chair 100 can be stored in a bag or other similar container for protection and ease of portability.

A level able and swiveling camp chair has been shown and described. The camp chair provides compact portability, level seating on uneven surfaces, and swivel action allowing the facing direction of the camp chair to be changed without repositioning the camp chair.

The description and illustration of one or more embodiments provided in this application are not intended to limit or restrict the scope of the invention as claimed in any way. The embodiments, examples, and details provided in this application are considered sufficient to convey possession and enable others to make and use the best mode of claimed invention. The claimed invention should not be construed as being limited to any embodiment, example, or detail provided in this application. Regardless of whether shown and described in combination or separately, the various features (both structural and methodological) are intended to be selectively included or omitted to produce an embodiment with a particular set of features. Having been provided with the description and illustration of the present application, one skilled in the art may envision variations, modifications, and alternate embodiments falling within the spirit of the broader aspects of the claimed invention and the general inventive concept embodied in this application that do not depart from the broader scope.

FIGURES – Option A

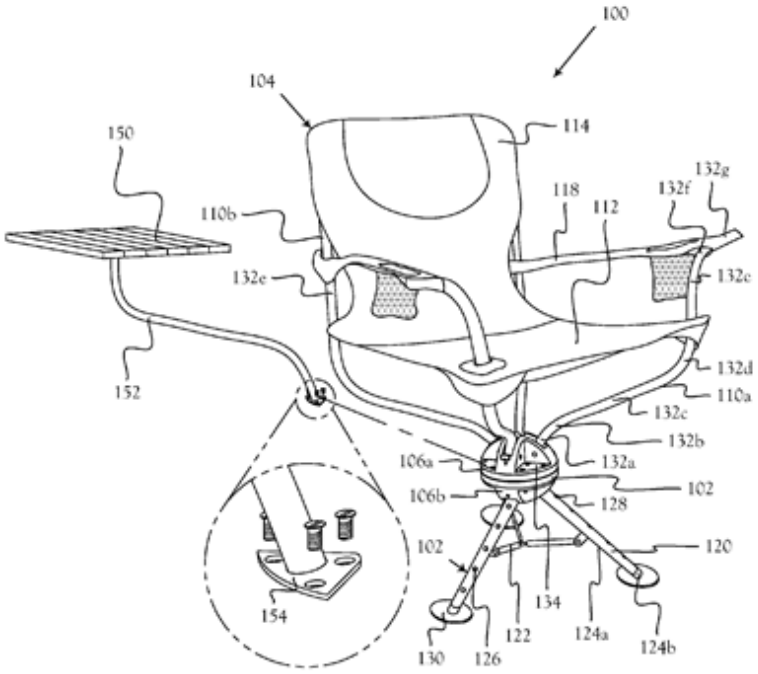


Fig. 1

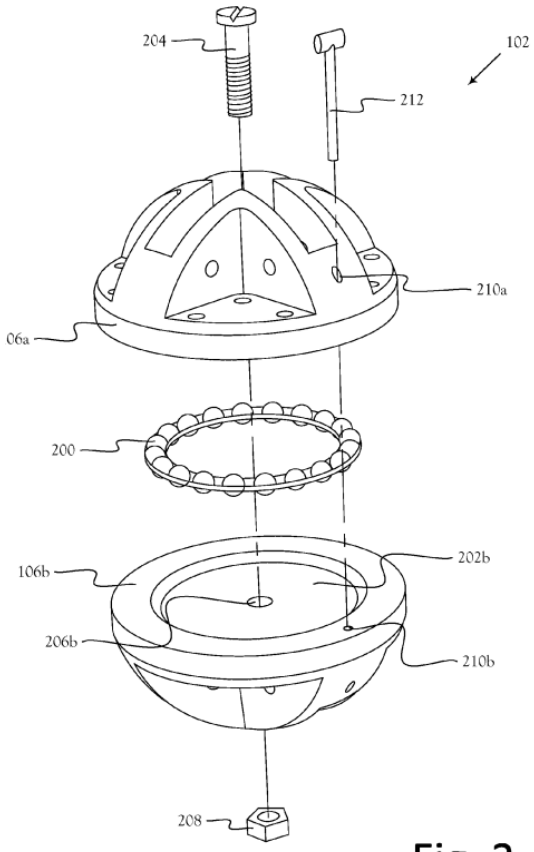


Fig. 2

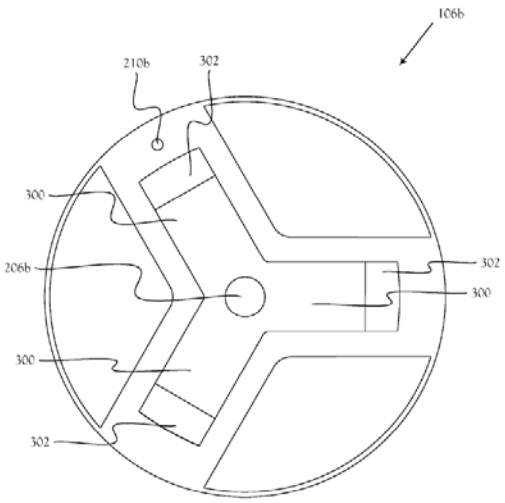


Fig. 3

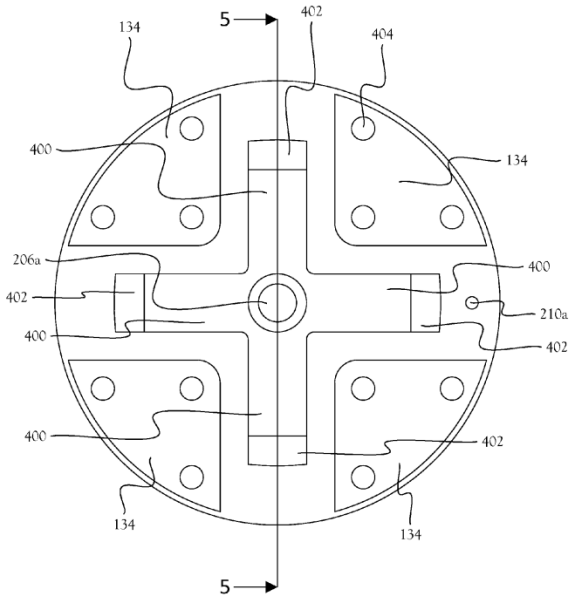


Fig. 4

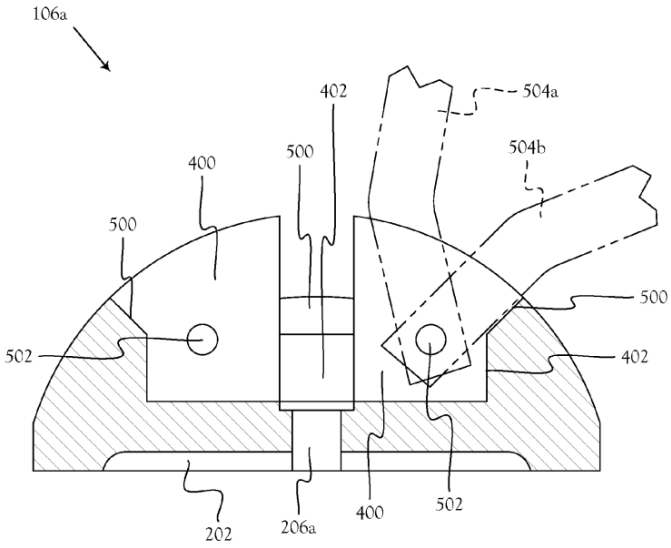


Fig. 5

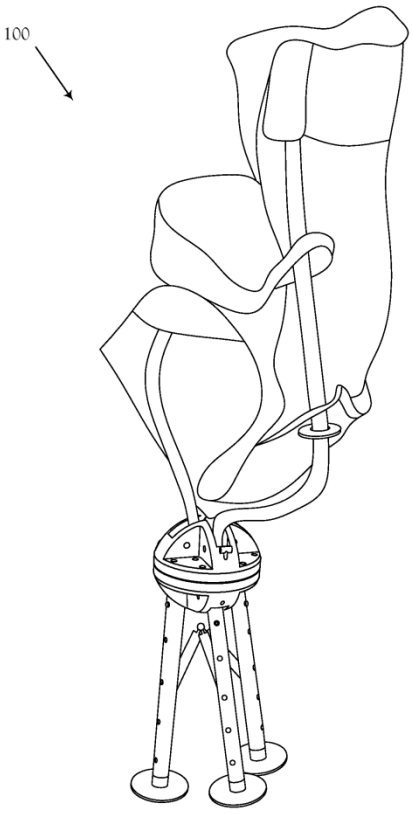


Fig. 6

Option B

An object of the present invention is to provide two plant-derived high molecular weight substances which have potent anti-HIV activity. Another object of the present invention is to provide anti-HIV agents having as active components the above-mentioned high molecular weight substances. Still another object of the present invention is to provide a method for obtaining the high molecular weight anti-HIV substances from pine cones.

The anti-HIV agents in the present invention are characterized in that said agents which contain alkaline-water extracts of various pine cones such as Pinus parviflora Sieb. et Zucc., especially high molecular weight anti-HIV substances of this extract. The high molecular weight anti-HIV substances described above can be obtained by extraction of the pine cone with alkaline water.

Other objects and characteristics of the invention will become apparent from further disclosure of the invention to be made in the following detailed description of preferred embodiment, with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows dose-dependent inhibition by KS-7 of viral production in CEM cells chronically infected with HIV.

FIG. 2 shows time course of inhibition by KS-7 of viral replication in CEM cells chronically infected with HIV.

FIG. 3 shows effect of KS-6 added just after the HIV infection.

FIG. 4 shows effect of pretreatment with KS-6 or KS-7 on HIV replication. Pine cones of various Pine trees such as Pinus parviflora Sieb. et Zucc., Pinus densiflora Sieb. et Zucc., and Pinus thunbergii Parl., can be used for the preparation of anti-HIV substances. It is preferable to use Pinus parviflora Sieb. et Zucc. due to an active substances. Pine cones collected at summer season are enriched in floating fatty materials, which might disturb further purification. Therefore the pine cones should be collected in October when active substances accumulate in abundance.

The substances with a certain extent of activity can be extracted from pine cone by hot water extraction. However alkaline water extraction is more effective than hot water extraction to obtain larger amounts of the active substances the pine cone. Either alkaline extracts or further fractionated materials can be used as effective anti-HIV substances. The present inventors presumed that substances which are contained in this extract and used as active ingredients are high molecular weight substances. The most potent substances were named as KS-6 and KS-7.

Alkaline water extracts used in this invention can be prepared by directly extracting a pine cone with aqueous alkaline solution such as aqueous NaOH. It is preferable, however, to obtain alkaline water extracts from a pine cone in which oils and hot-water extractable materials have been removed by extensive alcohol and boiling water washing before alkaline water extraction.

Either organic bases or inorganic bases can be used as alkaline substances for extraction media. The pH in aqueous alkaline solution is preferable to be more than 8.0; most preferably pH being 9.0 to 13.0.

The extracted solution should be concentrated to desired concentration, if needed, neutralized with appropriate acid and then lyophilized to give appropriate concentrated solution or solid. These can

be used as active components without further fractionation. Alternatively, the concentrate can be separated into precipitate and supernatant by some appropriate methods such as centrifugation. KS-6 can be obtained from precipitate by re-extraction with alkaline water, and KS-7 from supernatant by ethanol precipitation.

PURIFICATION PROCEDURE OF KS-6 AND KS-7

500g of pine cones was washed successively, twice with about 5 liters of methanol, and twice with 85% ethanol for 4 hours with reflux, and then extracted for 6 hours, 3 times with boiling water. The residue was extracted twice with 5 liters of 1% sodium hydroxide aqueous solution for 6 hours at room temperature. After removal of insoluble materials by filtration through gauze, the pH of the filtrate was adjusted to 5.0 with acetic acid. The precipitate was collected by centrifugation for 20 minutes at 10000 mg at 4.degree. C., dissolved in a small volume of 1% sodium hydroxide aqueous solution, centrifuged to remove insoluble materials and the supernatant was neutralized with acetic acid. The obtained substance is KS-6. The remaining supernatant was precipitated with one volume of ethanol to obtain KS-7. both KS-6 and KS-7 were dialyzed against distilled water and lyophilized. Yield of these substances KS-6 and KS-7 was about 0.5% and 1%, respectively.

ANALYTICAL PROCEDURES

Neutral sugar composition was analyzed by gas-liquid chromatography of trimethylsilyl derivatives of methyl glucosides obtained by methanalysis in methanolic HC1 for 16 hours at 65.degree. C. Neutral sugar content was also determined by the phenol-sulfuric acid method. Uronic acids were analyzed by gas-liquid chromatography of trimethylsilyl derivatives after their conversion to aldonolactone. Uronic acids content was determined by the carbazoIe method. Carbon, hydrogen, nitrogen and sulfur content was determined by element analyzer.

ENDOTOXIN ASSAY

The presence of endotoxin was determined by the Endospecy (Endotoxin Specific Test, Seikagaku Kogyo, Ltd., Japan) with Escherichia coli 0111:B4 endotoxin as a standard.

HIV INFECTION TO T CELL

The CEM cell used was a T cell line derived from human leukemia patient. The virus used was HIV N.Y. strain.

CEM cells were infected by addition with HIV-carrying culture medium. Infectivity of the virus released into the culture medium was assayed with reverse transcriptase (RT) activity and p24 antigen capture method.

KS-6 has a dark brownIsh color, with an absorption shoulder at 260-280 nm. It easily dissolves in water, and mixtures of water and alcohol, or acetone. It contains carbon (43.2wt %), hydrogen (4.0wt %), nitrogen (2.6wt %) and no sulfur. KS-6 contains also neutral sugars (11.0wt %) consisting of fucose (9.4mol %), mannnose (19.0mol %), galactose (44.7mol %) and glucose (26.9mol %), and a negligible amount of uronic acid (1.7wt %). The molecular weight determined by gel filtration under alkaline condition was 10 kD.

KS-7 also has brownish color, with an absorption shoulder at 260-280 nm. It easily dissolves in water, but tends to precipitate in physiological saline and the mixtures of water and alcohol, or acetone. It has carbon (33.55wt %), hydrogen (4.23wt %), and undetectable amount of nitrogen and sulfur. KS-7 contains also neutral sugars (39.5wt %) consisting of arabinose (16.5mol %), mannose (16.2mol %), galactose (39.3mol %) and glucose (26.0 mol %), and abundant uronic acid

(58.2wt %). The contamination of endotoxin was around 0.0025%. The molecular weight determined by gel filtration under alkaline condition was 10-200 kD.

ANTI-HIV ACTIVITY OF KS-6AND KS-7

1. Effect of KS-7 on chronic HIV infection -- A clone of the CEM T cell line was cultured for long period with HIV at low virus infection ratio. The chronically infected cells were incubated for 1 week with various concentration of KS-7 (0-350 .mu.g/ml). At various time points thereafter HIV production in culture supernatants was measured by RT method. As shown in FIG. 1, HIV replication was reduced by 66% by addition of KS-7 at concentration of as low as 7 .mu.g/ml. KS-7, at concentration of more than 70 .mu.g/ml, inhihIt HIV replication by more than 85%. Viability of CEM cells was not affected by treatment with 70 .mu.g/ml of KS-7. A similar degree of inhibition of HIV replication was observed in cells treated with 200 .mu.g/ml suramine, a potent inhibitor of retrovial RT. However, this concentration of suramine reduced the viability of CEM cells to 78%. The time course of the inhibition of HIV replication by KS-7 was next investigated. The chronically infected CEM cells were treated with 50 pg/ml or 100 .mu.g/ml KS-7 for 5, 7, 10, or 17 days and the viral RT activity recovered from the culture supernatant was determined as shown in FIG. 2. RT activity found in supernatants of the treated cells was at any time points inhibited by about 90%. This indicates that KS-7 inhibit viral production. It should be noted that the cells were diluted 1:5 and supplemented with fresh medium containing KS-7 at the time indicated by arrows, and the RT activity (ordinate) was plotted in log scale in FIG. 2.

2. Effect of KS-6 on acute HIV infection -- Next, the ability of KS-6 to inhibit virus replication in acute infection with HIV was investigated. The CEM cells were infected with HIV at high virus concentration. After viral adsorption, the cells were washed 3 times with medium and maintained at 5.times.10.sup.5 cells/ml in medium supplemented with various concentrations of KS-6 (ranged from 0-30.mu.g/ml). After incubation for 3 to 7 days, concentration of HIV p24 antigen in the culture supernatants was determined by a commercially available p24 antigen capture assay (Abbot's Lab.). As shown in FIG. 3, the antiviral activity was induced by KS-6 at more than 0.3 .mu.g/ml. Higher concentration of KS-6 ("3 pg/ml" or "30 .mu.g/ml") inhibited HIV replication by 50% and 88%, respectively. The viability of CEM cells was not significantly affected at any of these concentrations.
3. Effect of CEM cell pretreatment by KS- 6 or KS-7 -- It was Investigated whether pretreatment of CEM cells with KS-6 or KS-7 could enhance the inhibition of HIV replication. CEM cells were Pretreated for 1 or 7 days with various concentrations of KS- 6 (0.3-30 .mu.g/ml) or KS-7 (3-100 .mu.g/ml). After washing, the cells were infected with HIV virus at high virus concentration, and maintained in medium containing the same concentrations of KS-6 or KS-7 used in pretreatment. After 5 days incubation, the concentration of p24 in culture supernatant was determined by p24 antigen capture method. As seen in FIG. 4, a reduction of viral titer was observed in CEM cell cultures pretreated with 0.3 .mu.g/ml of KS-6. An 80-95% reduction of HIV replication was attained by KS-6 at the concentrations of 3 and 30 .mu.g/ml, respectively. 1n contrast, antiviral activity of KS-7 was slightly weaker than that of KS-6. The anti-HIV activity of KS- 7 was detected at more than 10 .mu.g/ml, and 95% inhibition of HIV replication was achieved by KS-7 at 30-100 .mu.g/ml.

The present data demonstrate that antitumor substances KS-6 and KS-7, prepared from alkaline water extracts of pine cone effectively inhibit HIV replication, and the antivial activity of these agents is augumented by pretreatment of the target cells with these agents before HIV infection. A distinguishing feature of human immunodeficiency virus (HIV) is its selective cytotoxicity for helper T lymphocytes. Infection in vivo is manifested by severe and diverse abberations of immune system and causes death. As described above, KS-6 and KS-7 of the present invention have potent anti-HIV activity, as well as their immunopotentiating activity manifested by activation of human peripheral blood monocytes and polymorphonuclear cells. Therefore, it is highly probable that these agents might improve the condition of AIDS patients and its effect might be augmented

by combinational treatment with other chemotherapeutic agents (e.g. azido-thymidine, dideoxycytidine, suramine).

The present invention relates to plant-derived high molecular weight substances which have potent anti-HIV activity. The human immunodeficiency virus (HIV) is the causative agent associated with AIDS (acquired immune deficiency syndrome), ARC (AIDS-related complex) and related diseases. A distinguishing feature of HIV is its selective cytotoxicity for helper T lymphocytes. Severe and diverse aberrations of the immune system significantly reduce the host defense against various opportunistic infections, resulting finally in a host death.

Nowadays, many anti-HIV agents including Krestin and Lentinan have been isolated from plants and chemically synthesized. However, the effects of most of these agents are generally weak and they have severe side effects.

In order to explore new type of anti-HIV substance, the present inventors have compared the anti-HIV activity of various plant components. The present inventors have found potent anti- HIV activity in the antitumor substances obtained from aqueous alkaline extract of pine cone. The substances with the most potent anti-HIV activity was named as KS-6 and KS-7.

FIGURES - Option B

FIG. 1

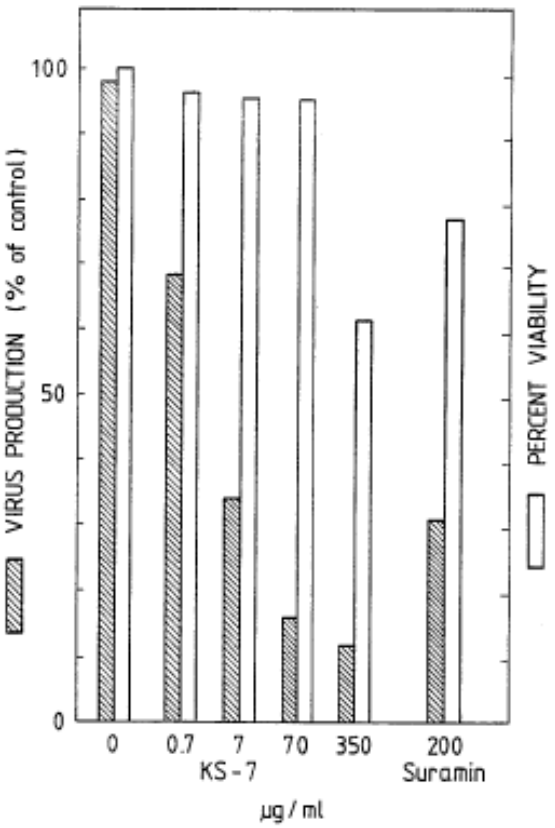


FIG. 2

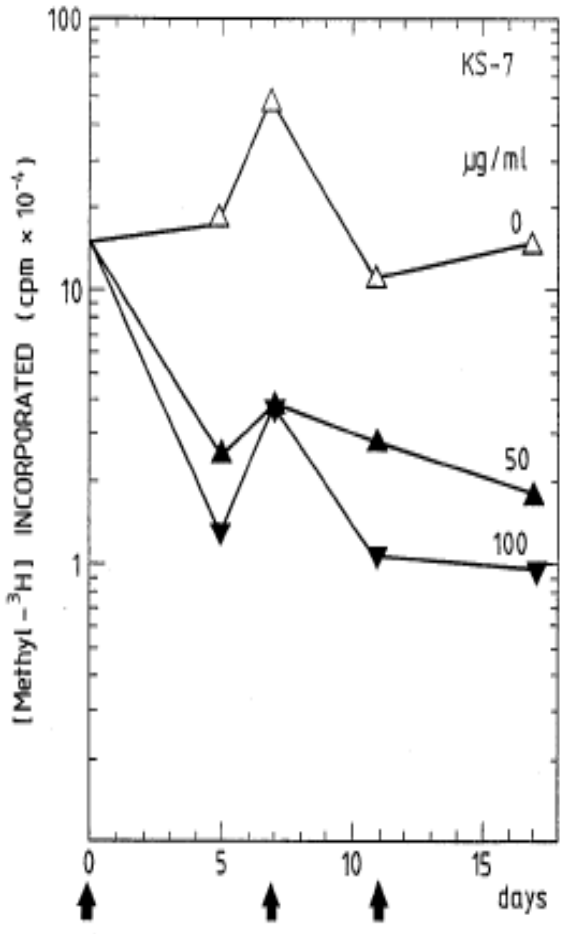


FIG. 3

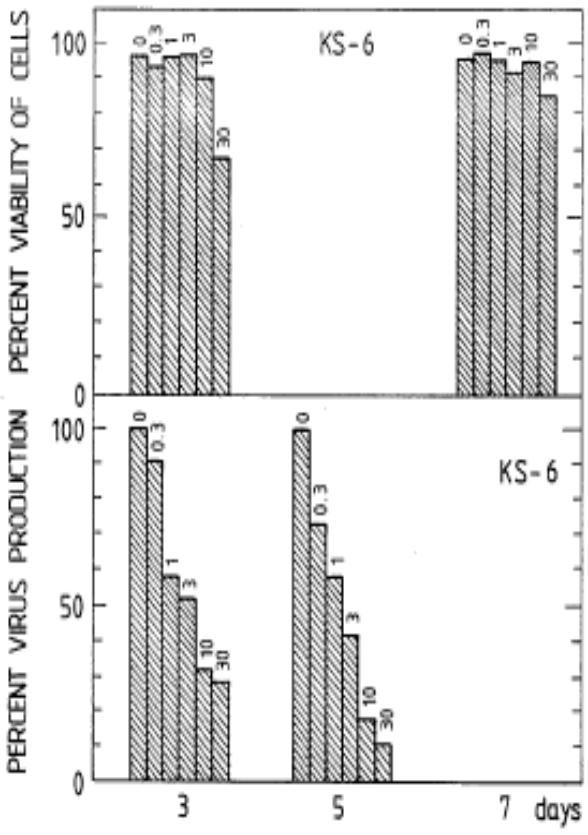
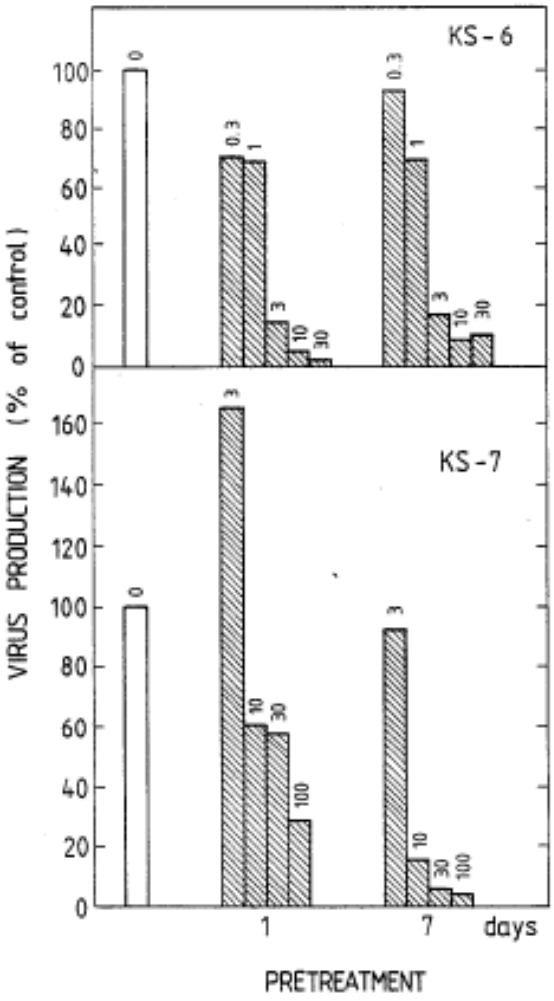

PERCENT VIRUS PRODUCTION
PERCENT VIABILITY OF CELLS
KS-6
KS-6
100
50
0
0
0.3
1
3
10
30
3
5
7
days

FIG. 4


VIRUS PRODUCTION (% of control)
KS-6
KS-7
100
80
60
40
20
0
160
140
120
0
0.3
1
3
10
30
100
1
7
days
PRETREATMENT