

# Tissue

## covering technique

Wrinkled tissue spoils the looks of a good model aeroplane! John Atkinson shows you how to obtain a perfect finish for your craft . . .

HOW MANY times have you enviously admired a beautifully covered model at a flying meeting or exhibition? One's own efforts so often fall far short of such perfection and yet there is really nothing very difficult in achieving a smooth, wrinkle-free finish. It is only a matter of taking extra care and, most important of all, *not rushing* the job! Once the structure is complete, I know it is a temptation to attempt to complete the covering in the shortest possible time, in order to get the model into the air. However, *do* try to resist it, for you will only be dissatisfied with the end result and wish that you had taken more time.

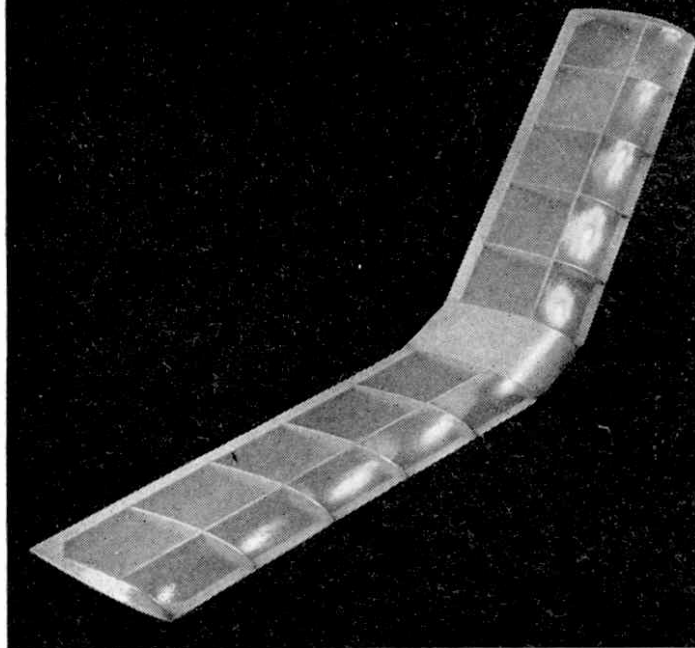
Besides producing a much better looking model, a good wrinkle-free covering job also considerably increases the model's strength. Flying performance benefits too; a smooth finish being far more efficient than a rough one. There are, of course, one or two 'tricks of the trade' which will simplify this important final constructional stage and these I will try to deal with in the article.

The quality of the finished job is determined long before the first tissue is applied to the framework—the correct preparation of the uncovered airframe being perhaps the most important single factor in achieving covering perfection.

### Preparation of the Frame

The first job is to go over the whole frame with fine sandpaper. Flour-paper is best for this, as it is sufficiently smooth to avoid rubbing away too much wood, thus distorting vital shapes and, at the same time, it has sufficient 'cutting power' to remove any irregularities of contour. Examine the structure carefully for small blobs of cement that may be sticking up; these must be carefully cut off.

When you are satisfied that the frame is perfectly smooth, give all the outside parts (those that will be in contact with the tissue covering) a coat of Sanding Sealer. This will, when dry, leave the wood with a rough surface, since it brings up the top fibres, but at the same time it also fills in the balsa wood pores. Next, use the



flour-paper again, to give the frame a silky smooth surface with *no* sharp projections.

Model aircraft covering tissue is especially made for the job. The best known brand in Great Britain is Modelspan, which may be bought in a variety of colours and in two grades—lightweight and heavyweight. Free flight models of up to about two feet wingspan generally use the lightweight grade, larger ones can be covered with the stronger heavyweight and sometimes silk or nylon.

The majority of control-line models use heavyweight tissue or nylon, all except the really small aircraft, where weight must be carefully 'pruned'.

There are many ways of actually attaching covering materials to the framework, but the easiest is by means of special tissue paste or one of the dextrine pastes such as Grip-fix.

Never try to cover a double curvature with *one* tissue panel. Such a situation often occurs at wingtips, the upper surface of which should be covered with a separate piece of tissue. By trying to pull the main wing covering tissue down to the tip, wrinkles are almost invariably introduced. The same applies where a dihedral break occurs. A new panel is needed wherever such a contour change takes place.

For a typical wing, you will need four pieces of tissue on its 'upperside'—one for each tip and one for each main panel—and two for its 'underside' which, usually being flat, needs no additional tip pieces.

Cut out your tissue panels a little oversize and note, when doing so, that one side of the tissue is slightly smoother than the other. The smooth side is the outside.

Spread a thin layer of paste over the outline of the framework—not on the ribs—and lay the tissue carefully in place. Gently press it down, easing it outwards, to achieve an overall even tension. The aim is not so much to stretch it *tight*, as to get it *smooth and even*.

When the whole frame is covered and the adhesive is dry, spray the tissue with water. A scent spray or an

artist's cheap fixative spray is ideal. Don't soak the tissue, just dampen it. The covering will now sag alarmingly, but don't be dismayed, for as the tissue dries it will tighten up to a drumlike surface.

Never attempt to hasten the drying out process by applying artificial heat, this can later result in a slackening of the covering or a warped model.

### Doping your model

Clear, shrinking dope is next brushed on to the taut tissue. This adds a lot of strength to the covering and fills in the many tiny pores in the tissue. Clear dope has tremendous shrinking power and, as it dries, will tend to distort the framework, unless it is pinned down to a flat surface. Pack the tissue-covered component clear of the surface on which you are working with small pieces of balsa to prevent the dope from sticking. Leave the covered frame pinned out for at least an hour—or longer if you can. Two coats of clear dope are normally required to achieve a good finish.

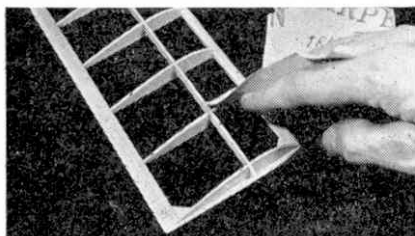
If you wish to colour dope the model, now is the time to do it. Colour dope has no shrinking powers and so it

must be applied over a base coat of clear dope. However, bear in mind that it does add a lot of weight to a small model and, wherever possible, should be avoided, if maximum flying performance is required.

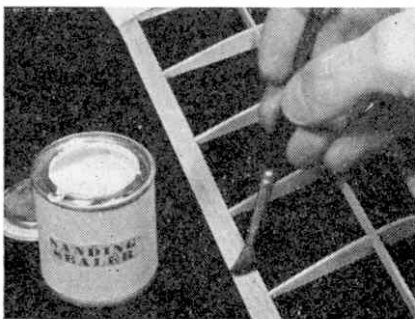
Always use the same type and make of both colour and clear dope. Never use different makes as they frequently interact and ruin a good covering job.

If your model is engine-powered, the dope will need to be 'fuel-proofed', the reason being that it is often attacked by engine fuel ingredients. Fuel-proofing is easy to carry out, as the proofer is merely a special kind of clear varnish which is brushed over the entire model. Particular attention must be paid to the engine bay, as it is always soaked with fuel.

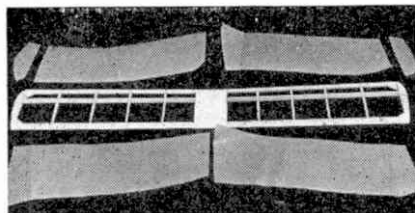
Some new types of colour dope are fuel-proof in themselves and require no further treatment. One of the best of these new colour dopes is Keil Kraft ethylate dope. Butyrate dopes and some plastic enamels are also fuel-proof, but have certain disadvantages and are often difficult to apply. If you carry out all the work described here, you should have a perfectly finished model aircraft.



Remove the surface roughness of the balsa airframe with flour-paper. This will avoid any bad patches showing on the finished work.



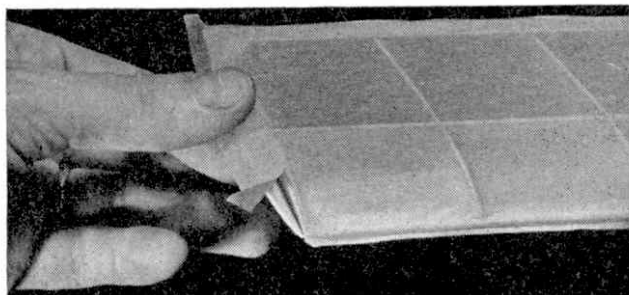
Next give the whole frame a coat of sanding sealer. When it is dry, remove any further roughness by once again using flour-paper.



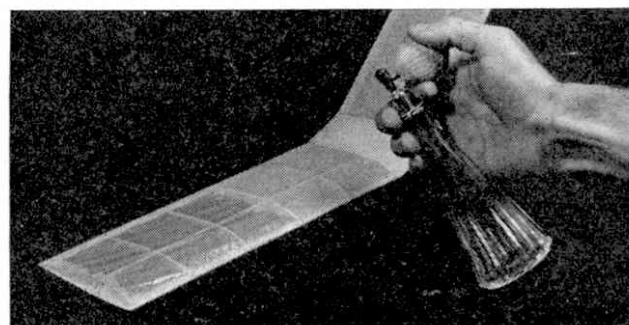
Cut covering tissue panels slightly on the large side. As tissue has a slight 'grain', it should run along the wing from root to tip.



When applying the adhesive, spread it thinly over outline of wing—not on the tissue itself. Grip-fix paste is ideal for most jobs.



Attach the tissue working from the root to the tip of the wing, gently easing it taut with the thumbs. Aim at getting an even covering and not a really tight job. Also, use separate pieces of tissue for tips of wings and other curves.



Next, when the adhesive is completely dry, spray the tissue covering with water. A scent spray is the ideal tool. Make sure you handle the model very carefully at this stage.



When the tissue is dry apply shrinking dope with a broad, soft brush, working quickly. As the dope has a very strong shrinking action, pin down drying framework to stop warping.